DOCUMENT RESUME

ED 159 658 CS 004 421

AUTHOR Reichman, Rachel
TITLE Conversational Coherency. Technical Report No. 95.
INSTITUTION Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois Univ., Urbana. Center for the Study of Reading.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.; Office of Naval Research, Arlington, Va. Personnel and Training Research Programs Office.; Rome Air Development Center, Griffiss AFB, N.Y.
PUB DATE Jul 78
CONTRACT 400-76-0116; N00014-76-C-0083; NR-154-379
NOTE 86p.

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS *Communication (Thought Transfer); *Connected Discourse; *Context Clues; Discourse Analysis; Language Patterns; Models; *Reading Research; Response Mode; Semantics; *Speech Communication; Speech Skills; Syntax
IDENTIFIERS *Center for the Study of Reading (Illinois); *Conversation

ABSTRACT

To analyze the process involved in maintaining conversational coherency, the study described in this paper used a construct called a "context space" that grouped utterances referring to a single issue or episode. The paper defines the types of context spaces, parses individual conversations to identify the underlying model or structure, and identifies the following elements of coherent conversations: topic discernment; semantic, structural, and state rules that maintain coherence; focus levels; and linguistic mechanisms such as clue word shifts, explicitly labelled shifts, modes of reference, repetition of words, and tense shifts. Based on these conversation elements, a process model is outlined that requires a conversant to respond appropriately to preceding utterances, and to integrate a speaker's utterance with preceding utterances. Appendixes include state assignment rules for a context space, semantic relational rules determined by the underlying structure of a conversation, and a focus level algorithm for the constituents of a given context space (the actors, objects, events, issues, location, time, and duration period). (MAI)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED159658

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CENTER FOR THE STUDY OF READING

Technical Report No. 95

CONVERSATIONAL COHERENCY

Rachel Reichman

Harvard University and
Bolt Beranek and Newman Inc.

July 1978

University of Illinois
at Urbana-Champaign
51 Gerty Drive
Champaign, Illinois 61820

Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

This research was sponsored by the Department of the Air Force, Rome Air Development Center, N.Y., F 30602-77-C-0197, and by Personnel and Training Research Programs, Psychological Sciences Division, Office of Naval Research, and ARPA--Contract No. N00014-76-C-0083, ONR Contract Authority Ident. NO., NR 154-379, and in part by the National Institute of Education under Contract No. US-NIE-C-400-76-0116.

CS 004421

TABLE OF CONTENTS

1. Introduction 1

1.1 Application To Current Research On Reading And Writing 2

1.2 Details of Methodology 4

1.3 A Conversation Analyzed 4

1.4 Overview & Relation To Previous Research 6

2. Context Spaces 16

2.1 Types of Context Spaces and Their Constituent Entities 16

3. Context Space Relationships 18

4. Some Elements Underlying Coherent Conversations 24

4.1 Topic Discernment 25

4.1.1 Conversational Coherency -- Topic 25

4.2 Semantic Relational Rules 27

4.2.1 Structural Considerations 27

4.2.2 State Considerations 27

4.2.3 An Example Of The Use Of Semantic Relational Rules To Maintain Coherency 30

4.3 Determining Focus Levels 32

4.3.1 Conversational Coherency -- Focus Levels 33

5. Linguistic Mechanisms 37

5.1 Clue Word Shifts and Deictic Expressions 37

5.2 Explicitly Labelled Shifts 41

TABLE OF CONTENTS (CONTINUED)

5.3 Mode of Reference 42

5.4 Repetition of Words 47

5.5 Tense Shift 48

6. A Process Model 51

7. Excerpt 3 Analyzed In Terms Of The Theory 59

8. Conclusion 63

9. Appendix 65

3-A

Conversational Coherency

Rachel Reichman

1. Introduction

While classes are given to teach the rules of writing, conversational speech has often been thought of as a rule-free process of communication. The analysis of actual dialogues forces one to reject such an hypothesis and to recognize that oral speech is a rule governed mode of communication.

This paper demonstrates that the conversations in which people partake daily are highly structured and formally analyzable entities. Some of the implicitly understood rules used by the participants in a conversation are made explicit and formalized. These rules identify some of the necessary elements of a coherent conversation, and their violation results in a breakdown of this coherency.

This research rests upon the assumption that we all have some notion of 'coherency'. My goals are to identify some procedures by which a person analyzing a conversation can formally explain a conversation's seeming coherency or incoherency, and to specify some steps of the process by which participants maintain coherency in their conversations.(1)

---

(1) A complete model of such a process would have to include inter alia a semantic component that was capable of determining, for example, that the event, 'Alice hit Bob,' was an example of the generic activity, 'Person X hitting Object Y'.

1.1 Application To Current Research On Reading And Writing

In studying the literature, one notices a renewed interest on the part of educators and cognitive scientists in the tasks of reading and writing. A recent work by Rubin (1977) stresses the necessity of differentiating between the skills required in oral and written communication. As Rubin correctly points out, a switch in the medium of communication from oral to written often influences many aspects of the communicative process such as: concreteness of reference, interaction involvement, spatial and temporal commonality, etc. Rubin rejects the traditional position which contends that reading comprehension = oral comprehension skills + decoding. Moreover, she feels that it is quite possible that children might have to unlearn many of the skills of oral communication to achieve reading competence. While the work undertaken here does not delineate the cognitive skills required in reading, writing, or conversational speech, the findings may, nevertheless, help those studying a child learning, or having difficulty with, reading and writing.

As noted above, this work describes the nature of conversations and formalizes rules used by conversants in the process of oral communication. The paper demonstrates that speakers use linguistic mechanisms that parallel accepted conventions of what appropriately follows what in conversation. Since a reader's first contact with language is usually in the form of oral speech, it follows that s/he will initially attempt to apply those skills acquired for speech to the task of reading. What are those skills? What are these assumptions that s/he uses in oral communication that s/he probably assumes will apply to reading? Do they apply to reading, or as Rubin suggests, do they have to be unlearned? In order to answer these questions we obviously have to know more about the processes of both oral and written communication.

After reading this paper, the researcher interested in reading and writing will have some notion of the expectations and assumptions that a child will most likely be bringing to her/his first encounter with these tasks. The researcher can then use this knowledge in some of the following ways:

(1) As an aid in identifying the underlying structure of written material and the rules governing this mode of communication. Knowledge of the types of rules and relationships occurring in oral speech can be used as a guide for analysis of alternative modes of communication.

(2) As an aid in teaching a child to read. Having found similar structures and rules by (1), a curriculum for teaching reading can be constructed wherein a teacher can take advantage of the language skills that the child is bringing to this task. The structures and mechanisms found in writing that are isomorphic in nature to the ones in oral communication should be so explained to the child. For example, a linguistic clue word may be used in oral communication to indicate a shift in topic while a paragraph indentation is used in written material. This correspondence could be pointed out to the child.

(3) As a means of identifying the source of a child's difficulty in reading and planning ways to alleviate this difficulty. A child's difficulty with reading may be due to written material lacking isomorphisms to rules and/or structures appearing in oral language. If these rules and/or structures can be identified we could then explain to the child their inapplicability to written text, thereby preventing misinterpretations on her/his part. Additionally, if new rules or structures surface in our analysis of written material, we could plan our teaching curriculums so that the new, unfamiliar, items would be heavily stressed.

1.2 Details of Methodology

I decided to approach this area of research by taping actual conversations that transpired between people. My aim was to describe what rules or regularities, if any, govern the sequences of utterances within a conversation.

The findings, specified below, are the result of a detailed analysis of two taped recordings of free dialogue; each recording is about forty-five minutes long. These findings were then used in an analysis of four additional taped recordings each about a half hour in length. These later tapes supported and evidenced the predictions specified in the theory. In all, eight people were recorded. Each conversation occurred naturally between two friends, who were aware that they were being taped. They did not know, however, any of my specific goals in the endeavor.

The individuals involved were all young female adults. Their conversations deal in the main with personal aspects of their lives and people that they know in common. I believe that the rules formalized do apply to a much wider range of population and type of discourse. To confirm this hypothesis, as the next stage of this research I plan to study different kinds of conversations and conversants of various ages and social relations.

1.3 A Conversation Analyzed

Consider the following excerpt of an actual conversation between two friends, Sue and Amy.(2) Sue has just recently broken up with her boy friend,

---

(2) All names appearing in the transcripts are fictional. Underlines have been used for reference purposes later in the work. There is no correspondence between the underlines and intonational stress patternsns. Gestural movements, facial expressions, intonation patterns, and length of pauses, are not reflected in the transcripts or in the analysis. I believe that my conclusions are

Albert, and is describing to Amy the circumstances of the breakup and her present emotional state. The parsing structure on the right and the underlines can be ignored for the present; they will be referred to later. In this and all other excerpts a comma is used for a short pause, a dash for an incomplete thought, and a period for the end of a single thought.

-EXCERPT 1-

S: 1. I used to be a very emotional person, — ¬C1
2. Amy. Do you know what I said about
3. Albert? I mean - and Carol pointed this — C2 — FULL ILLUSTRATIVE RELATION (C1 - C2)
4. out to me, and it was just so funny -
5. I <u>am</u> so afraid - I mean it's so funny,
6. one of my problems is that I - I - I put — C1
7. everything, my feelings, in a total
8. intellectual basis. <u>I said</u> that - <u>it's</u> — C2
9. funny 'cause, <u>by the way</u>, when I was
10. thinking about <u>Albert</u>, I was thinking
11. about how I would think about <u>Albert</u>, — C3 — INTERRUPTION RELATION (C2 - C3)
12. years from now. You know look back upon
13. it and what context <u>Albert</u> would fit in
14. my life. And my gut phrase was, and <u>I</u>
15. <u>said</u>, <u>"And I decided that history will</u>
16. <u>really be kind to Albert."</u> That is what I
17. said, and <u>she</u> said, "Well you can't get — C2 — RETURN RELATION (C2,C3 - C2)
18. much more removed than that." And I
19. thought - and I realized that was the
20. terms I put it in. That when - Because,
21. you know, <u>it's</u> true, I do believe that. I
22. went through a very healthy thing with
23. <u>Albert</u>, and that is really - no matter
24. what, restored a lot.

A: 25. That's very important.

S: 26. Yeah, and so for that, no matter what, - — C4 — TOTAL SHIFT RELATION (C2 - C4)
27. I mean I can feel angry at him now,

A: 28. Well you had a real relationship.

---

independently discernible and valid, and expect that a detailed analysis of such prosodics would be consistent with my findings. However, I am aware that the lack of such information may cause a reader some difficulty on their first reading of the excerpts. Any awkwardness or incoherence that the reader notices in their reading is probably (unless I specify otherwise) due to this lack. The actual conversations flowed smoothly.

S: 29. Yeah, exactly.

A: 30. No matter what.

S: 31. Exactly. And that was real important to
32. me. It proved something to me. It
33. proved that I could, and I didn't know if
34. I could. You know? And so - But that's
35. what I said, I said "History will be kind
36. to Albert," and she just kinda looked at
37. me.

C4

C2

SIMPLE RESPECIFICATION RELATION (C2,C4 - C2)

The passage seems to have a number of very puzzling aspects. To mention but a few -

(1) Why in reference after reference {Lines 10,11,13,16,23} is Albert referred to by name rather than pronominal form, whereas, despite the many intervening statements between the references, Carol is repeatedly {Lines 17,36} referred to by pronominal form?

(2) What does 'by the way' {Line 9} tell us about the relationship between the preceding and succeeding utterances? Why, in this case, is the succeeding utterance appropriate, whereas, the utterance, "By the way, my dog was run over by a car a year ago," would be inappropriate?

(3) What is the function of the word 'but' in the sentence, "But that's what I said..." {Line 34}. The usual sense of 'but' is to negate a presupposition in the preceding clause. However, there is no presupposition in the preceding clause to negate. What is 'but' doing then?

The theory proposed in this paper addresses and answers such questions about the nature of conversations.

1.4 Overview & Relation To Previous Research

Current research on conversational speech has been heavily centered on understanding the intent and semantic import of individual utterances or groups

of utterances within a single domain (Allen & Perrault, 1978; Bullwinkle, 1977; Kaplan, 1977; Grosz,1977). Their approaches are based on speech act interpretation, recognizing the goals and plans underlying a speaker's utterances, having knowledge about physical and conceptual properties of one's world, and knowledge of one's conversant's knowledge of this same world. The research of Dore (1977), and Labov & Fanshel (1977) may also be categorized in the above group as they also stress speech act interpretation. However, the works of Dore and Labov & Fanshel differ in the types and levels of speech acts identified as underlying utterances. In addition, Dore and Labov & Fanshel are not concerned with actually modelling the process of understanding and so need not be constrained to any particular domain. The works of Bruce (1977), and Cohen (1978), are also based on the above types of analyses (i.e., speech act interpretation, recognition of a person's goals, belief structures, etc.). However, Cohen's aim is to model the incorporation of speech acts into plans to achieve non linguistic goals, rather than to model the processes by which utterances are understood. And Bruce's concentration is on the analysis of stories in an attempt to identify a story's underlying plot, and to recognize the dynamics occurring therein by the interpretation of speech acts as social actions.

The analysis of conversation given in this paper differs fundamentally from the research mentioned above. It stresses the importance of identifying the structural relationships among groups of utterances in order to explain many linguistic phenomena and to identify those elements underlying a coherent conversation, rather than deeply analyzing the semantic and pragmatic content of individual utterances. The analysis is content-independent and is concerned with specifying some of the abstract mechanisms that participants seem to employ in order to facilitate coherency in their conversations. A comprehensive

conversational system would necessitate both levels of analysis working simultaneously on these different aspects of discourse.

Certain features of the work of Grosz (1977) are however closely related to the work being presented here. Grosz demonstrated that a task-related dialogue has an underlying structure that parallels the structure of the task being discussed. This structure can be seen as the relationship of a number of utterances to each other, which then in turn hierarchically relate as a single unit to another group of utterances. For example, given a task A which has subtasks B and C, where subtask B has subtask D, and subtask C has subtasks E & F, a dialogue corresponding to such a task might have the following type of hierarchical structure: (X) a group of utterances related to the overall task A, (SUB X) a group of utterances related to subtask C, (SUB(SUB X)) a group of utterances related to subtask E, (SUB(SUB X)) a group of utterances related to subtask F, (SUB X) yet another group of utterances related to subtask C.

For each such group of utterances Grosz builds a 'focus space.' All items mentioned in an input utterance are considered in 'explicit' focus in that space. For each item in explicit focus an associated set of items, taken from a knowledge representation, are considered to be in 'implicit' focus.

A focus space under discussion is called an 'active' focus space; one that concerns an unfinished topic and may become active again is called an 'open' focus space; and one whose topic has been fully discussed is called a 'closed' focus space. A new active focus space is created whenever: (1) A new subtask is entered, (2) A new parallel level task is entered, (3) A new higher level task is entered, (4) A subtask of any of the above is entered. Criteria (1) through (4) are determined by the semantic processing of the input sentence and then finding where in the hierarchically structured knowledge representation this step of the task lies. In the case of (1) the new active focus space (NA) is

created below the current active focus space (CA) whose 'state' is changed to open. In general, the structural placement of NA and the change in CA's state is determined by the hierarchical relationship between the step corresponding to NA and the step corresponding to CA. CA is closed whenever a task at the same or higher level is entered. It is left open whenever a lower level task is entered. Whenever a lower level focus space is closed the open focus space at the next highest level becomes the active focus space.

Grosz used this notion of a focus space with an associated state -- open, active or closed -- to highlight those items in the knowledge representation that were most relevant to the current discourse for the purposes of anaphoric reference disambiguation.

The analysis presented in this paper heavily rests upon this same notion of grouping utterances into separate spaces, recognizing that the structure underlying a conversation is the set of relationships that hold among these spaces, and that at any point in the conversation spaces have different degrees of relevancy. The conversations studied in this work were all of an informal and social nature. Therefore, unlike the work of Grosz, this work does not rest upon a global knowledge of a domain structure and its relationship to the structure of the ensuing conversation. Rather, a major part of this work is: to independently formalize what constitutes a space; to identify, and demonstrate the importance of, some general relationships that spaces seem to have with one another; and to bring to light some of the linguistic mechanisms that speakers use to indicate these relationships.

Below I will show how this notion of grouping utterances into related spaces is needed to understand a conversation's coherency. I will also give a brief overview of some additional elements underlying coherent conversations that are identified in this work. For the purposes of clarity of exposition and

theoretical simplicity these elements are stated in terms of two-party conversations, although there are clear extensions to conversations with three or more participants.

(A) The Partitioning Of Utterances Into A Hierarchy Of Context Spaces: In a coherent conversation the relationship between successive utterances is clear.

In his study of 'small talk'(3) Schank (1977) formalized some of the possible relationships that utterances may have with one another. His analysis was based on keeping track of the discourse topic which he claimed was changed each time an utterance was made. The new topic consisted of the intersection of all the concepts(4) of the old topic with the concepts in the succeeding utterance, plus all the new concepts mentioned in the succeeding utterance. Schank's study then showed that an appropriate succeeding utterance to a preceding one was one that concerned the concepts of this new topic.(5)

One could infer from Schank's work that coherency depended on each succeeding utterance's being so related to a preceding one. Such an inference, however, would be incorrect. As Schank himself points out, his work was meant to apply to 'small talk'. As such, his analysis was based on studying pairs of sentences, where the first statement of such a pair would be a remark made by a speaker A, and the second statement of the pair would be a response to that statement by a speaker B.

---

(3) Small talk refers to short interchanges of a superficial nature such as one often encounters in a cocktail party.
(4) Schank uses 'concept' to refer to any object, person, location, action, state or time mentioned in an utterance.
(5) Schank's work can be seen as an analysis of a two part process. The first part of his work, with which I am concerned here, discusses topics and topic shifts. The second part discusses the procedure by which people decide what to say about a given concept once they have decided to discuss that concept based on its relevancy to the present topic of discourse. I believe that some aspects of such a procedure do apply to actual conversation as well as to 'small talk'. I therefore would not want the reader to infer from my discussion here that I consider all of Schank's work tangential to any theory of actual conversation.

In actual conversation, one rarely finds this type of paradigm. Rather, one speaker has usually made a number of statements by the time a second party is called upon to respond. Often these succeeding utterances do not share concepts at all, but might refer to events that took place in a single episode. Using Schank's analysis, these successive utterances would be inappropriately connected and would constitute radical topic shifts at each turn.

To determine the relationship between utterances it is necessary to realize that their relationship does not depend upon their sharing concepts. As noted above, successive utterances must often be seen as constituting a structured unit. Such a unit shall hereafter be referred to as a 'context space'.(6) Two utterances are related by either being part of the same context space or by the relationship between their respective context spaces.

To recognize that line 34 of Excerpt 1 is not a non sequitur, one must understand that it introduces a context space whose structural relationship to preceding context spaces is understood. As indicated on the right hand side of Excerpt 1, line 34 lies in context space C2. Its preceding utterance lies in context space C4, which is made up of lines 21 - 33. The reader should notice that immediately before Sue began her discussion of C4 she had been discussing C2, an episode that occurred between herself and Carol. Quite often in conversation a person will tell a story and then immediately upon completion of that story begin a new, but related, topic. Upon completion of the new topic the initial speaker may repeat the major point of the initial story, for fear

(6) The underlying principle of a context space is the same as that of Grosz's focus space, i.e., it forms a unit out of a number of utterances. However, as stated previously, a focus space consisted of those utterances within a dialogue which referred to a single task or subtask. As I am not analyzing task-oriented dialogues the utterances belonging to a single context space are of a different nature. Roughly, a group of utterances referring to a single episode or issue forms the basis for a context space.

that in the quick transition this point was lost upon the hearer. This is what has happened in Excerpt 1. The conversation continued to run smoothly as the listener understood what had taken place, i.e., that context space C4 had been completed and that context space C2 was being returned to.

There are many linguistic mechanisms by which context space transitions are indicated to the listener. One such mechanism is the use of the clue word 'but'. 'But' is used to close the context space under present discussion and to return to one that was previously discussed. This is precisely the function being carried out by the 'but' on line 34. Rather than denying a presupposition of a preceding utterance, it is being used to deny a presupposition of the preceding discourse. The presupposition being denied by Sue is the likely inference on the part of Amy that since Sue closed C2 and began a new topic of discourse in C4 she had finished all discussion of C2 and would now just continue to develop C4. Sue uses the clue word 'but' to deny any such presupposition that Amy might have made based on the discourse structure. A paraphrase of 'but' here would be something like this: 'Set aside all utterances relating to the present topic of discourse. I wish to return to the topic of previous utterances.'

Thus, to understand the relationship of line 34 to line 33, and to correctly interpret and determine the scope of such alternate uses of linguistic connectives such as 'but', one needs to have a notion of a context space and context space transitions.

(B) Role Distinction: Participants seem to alternate between two major roles during a conversation. Each role has associated with it certain rights, obligations and expectations. In the speaker's role, a participant is expected and entitled to bring up a topic for discussion, and to indicate items which s/he wishes to focus upon. In the listener's role, a participant is expected

and obliged to adhere to the topic brought up by the speaker, and to discuss those items which the speaker has brought into focus.

(C) The Discernment Of Topic From Context Space Relationships: Given that the underlying cohesiveness of a group of utterances lies in their referring to the events of a single episode, one still has to determine an appropriate topic for the narrative. The listener can often determine this topic by understanding the relationship between the context space of these utterances and a preceding one. For example, the context space preceding C2 in Excerpt 1 is C1, concerning the issue of Sue no longer being an emotional person. C2 concerns an episode with a number of event parts, one of which is Sue saying that history will look kindly upon her ex-boy friend Albert. Recognizing that this event exemplifies the issue of C1 enables the listener to understand the relevancy and purpose of the narrative at this particular time in the conversation.

(D) Determining Focus Levels From Context Space Relationships: A major component in deciding upon a topic of a group of utterances lies in selecting those items of the context space from which the topic is constructed. Grosz differentiated between those items that were in explicit focus, implicit focus and non-focused. It is my feeling, however, that such a differentiation is not yet sufficient, and that we must also distinguish in importance among those items in explicit focus.

In the development of a context space a speaker will often introduce many concepts that are tangential to its main point. Such concepts are often introduced merely as the vehicle through which a speaker can convey a thought. For example, to illustrate that John is cute, a speaker may relate an episode that took place in a park, between John and a poodle that s/he saw while on the way to work. If a hearer were to give equal importance to all these concepts s/he would be missing the point of the narrative. Mere mention of a concept does not imply that a speaker is focusing on this concept.

As stated in (B), for an utterance on the part of a listener to be appropriate it must at least concern those concepts that the speaker has brought into focus. In the above, for example, a response that concerned the park or poodle would be inappropriate. Using the context in which a context space is cited enables one to understand which of the concepts in a context space are of direct relevance to the point being made. In this paper, rules based on context space relationships are given that assign different 'focus levels' to the items of a context space in order to capture such a differentiation.

Just as context space transitions are signalled in our speech by such clue words as 'but', so are the different focus levels attributed to a concept. Only those items with high focus levels will be referred to by pronominal form. This explains Sue's repeated nonpronominal references to Albert in C2. One aspect of understanding the point of this narrative rests in the realization that while Albert plays a role in C2, Sue's focus of attention is not on him at all.

Differentiating between the focus levels of the explicitly mentioned items in a context space is necessary both to determine the topic of a group of utterances (and appropriate response) and to explain certain of the rules that seem to govern inter-sentential pronominalization in discourse.

(E) Obligations Associated With The Role Of Speaker: As stated in (B), a speaker is entitled to bring up a topic for discussion and to indicate those items that s/he wishes to focus upon. However, there are certain obligations in this role as well.

(1) Connectivity: A speaker's utterances have to clearly follow one another so that the listener is always able to discern the underlying topic.

(2) Precision: A speaker is constrained to the introduction of a single topic and is not given license to discuss tangential items.

As shown in (A) and (C), by grouping utterances into a context space that has a formal relationship to the context spaces that precede it, a speaker enables a listener to determine the topic of her/his utterances. Each type of relationship has rules that identify the type of utterances that are appropriate in its constituent context spaces. For example, if an episode is cited to exemplify a particular issue under discussion, elaboration upon events which occurred in the episode but that were not instances of this issue would be inappropriate. Such elaboration would indicate to the listener that the speaker was bringing up this episode to focus on issues other than the initial one. The listener would then be confused as to the connection of the narrative to preceding utterances. At this point the listener would have two options; to decide that her/his initial expectations were incorrect and reanalyze previous utterances trying to find a relation between the elaborated-upon events and the preceding discourse; or s/he could hold onto the initial expectations and decide that the speaker is being inappropriate. The latter alternative is often chosen and manifested in a listener's saying, 'Well get to the point already, okay?'

There are a number of rules that specify what an appropriate utterance would be in light of preceding utterances. These rules serve to demonstrate that while only a single context space may be active at any one time in the conversation, preceding context spaces can highly affect what can be said within this active context space. To capture this influence of preceding context spaces on the current discourse, I have distinguished five states in which a context space may be at any one time. In the example given above the episode being cited lies in the active context space, while the preceding context space that contains the initial issue under discussion is said to be in a 'controlling' state.

(3) The Use Of Context Space Indicators: A speaker should use linguistic mechanisms to indicate to the listener the relationship between the context space s/he is developing and the preceding ones.

(4) The Use Of Focus Level Indicators: The speaker's focus level assignments to the entities of a given context space should also be reflected in her/his speech.

2. Context Spaces

Superficially a conversation is a sequence of utterances; at a deeper level it is a structured entity whose utterances can be parsed into hierarchically related 'context spaces'. Roughly, a group of utterances that refers to a single issue or episode forms the basis for a context space. I shall demonstrate that a conversation may be segmented into a number of context spaces which stand in certain formal relationships one to another. The major thrust of this paper will be on the syntactic mechanisms used by speakers to shift between context spaces, and to specify what is a reasonable shift of context. It is, however, first necessary to discuss what constitutes a single context space within a conversation.

2.1 Types of Context Spaces and Their Constituent Entities

There are at least two types of context spaces, issue context spaces, and event context spaces. The constituent entities of each are the following abstractions derived from a set of utterances:

An Issue Context Space:

1. A general issue of concern (which is its topic)
2. The actors (and objects) participating in the issue, if any
3. The time of occurrence of the issue, if any
4. The duration period of this issue, if any
5. Focus level assignments to each of the above

6. State of the context space at a given time in the conversation

Consider context space C1 of Excerpt 1.

Actors: Sue

Issue: Sue, in general, putting her feelings on an intellectual basis

Time: The present

Duration: From not too far back in the past to present

An Event Context Space:

1. A particular episode and the events that occurred therein
2. The actors (and objects) participating in the episode
3. The location at which the episode occurred
4. The time of occurrence of the episode
5. The duration period of the episode
6. Focus level assignments to each of the above
7. A topic of, or point being expressed by, the event context space
8. State of the context space at a given time in the conversation

Consider context space C2 of Excerpt 1.

Actors: Sue, Carol, and Albert

Main Event: A conversation between Sue and Carol

Event Parts: Sue says to Carol that "history will be kind to Albert"
Carol looks at Sue

Time: Past

Duration: Unspecified

Location: Unspecified

Topic: Sue, in a conversation with Carol, putting her feelings about her recent breakup on an intellectual basis

All of the utterances in the dialogues studied were covered by these two types of context spaces. However, I expect the analysis of further conversations, particularly those of a more explanatory and technical nature, to result in the formalization of other types of context spaces.

3. Context Space Relationships

The underlying structure of a conversation is the set of relationships that hold among its constituent context spaces. The context space relationships evidenced in the dialogues studied are listed below. The sequence of context spaces in the lists represent the order in which the context spaces occur in a conversation. The lists are written in Kleene Plus notation, i.e., + indicates one or more instances of the item in parenthesis, and * indicates zero or more instances of this item.

Illustrative and Restatement Relations. An Illustrative Relation is a relation between an issue context space and a succeeding event context space, and is represented by the relation between (1) and (2) below. The Restatement Relation is represented by the relation between (1),(2) and (3).

(1) Issue context space
(2) (An event context space that exemplifies that issue)+
(3) The issue context space of (1) restated

There are two types of illustrative context spaces: (1) Reference Illustrative is when the event context space being cited is already known to the listener. This is the relation between issue context space C1 and event context space C3 in Excerpt 3, which appears at the end of this section. (2) Full Illustrative is when the listener does not have previous knowledge of the events in the cited event context space. An example of this is the relation between context spaces C1 and C2 in Excerpt 1. A second example is the relation between issue context space C1 and event context space C2 in Excerpt 3.(7)

An Illustrative Relation is usually followed by the Restatement Relation, in effect closing the issue context space. Its function may be paraphrased by the following: 'So yes in light of the evidence and illustration of this issue

(7) Labov & Fanshel (1977, pp.104-110) also note this relation in their discussion of the role of a narrative in discourse.

by these narratives I would agree/or hope that you agree that this issue is a real one. Now that we've dealt with it let's go on to talk about something else.'

Generalization Relation. A Generalization Relation is a relation between an event context space and a succeeding issue context space and is represented by the relation between (1) and (2) below.

(1) (Event context space)+
(2) An issue context space whose issue of concern is a general activity discussed in the event context spaces of (1)

The relation between event context space C2 and C3 and issue context space C4 in Excerpt 3 exemplifies this relation. The general activity that is specified in C4 and common to both C2 and C3 is P's sensitivity to unpleasant situations.

Interruption and Return Relations. The Interruption Relation is represented by the relation between (1) and (2) below, and the Return Relation is represented by the relation between (1),(2) and (3) below.

(1) Issue or Event context space
(2) Issue or Event context space that is a digression
(3) Issue or Event context space that is a continuation of (1)

There are three things that can cause an interruption: (1) Something mentioned in the first context space triggers off an association that leads to a digression. An example of such a digression is context space C3 in Excerpt 1. A second example of this occurs in Excerpt 2 below. At this point in the conversation D is in the middle of telling S an experience she had (context space C1) that showed her the continued existence of discrimination. (Her opening statement in the development of C1 was, "Speaking of discrimination, I wanted to tell you this story, a really good story for you about what happened. It really shook me. It was really surprising how much discrimination there still is in 1977.")

-EXCERPT 2-

D: 1. He made a comment to me about uh, I'm
2. not too sure what it was, something about
3. the Portuguese people. Incidentally,
4. while I was standing there I noticed that
5. people were speaking what I thought was
6. Spanish or French. I couldn't really
7. tell, and I asked someone and they said
8. it was Portuguese. And I thought to
9. myself, "Isn't that nice, there are a lot
10. of Portuguese people here," or you know,
11. foreign people. I like people that speak
12. different languages. It reminds me of
13. Puerto Rico.

S: 14. This was in Dartmouth, right? Maybe
15. there's a big Portuguese community there.

D: 16. Yeah, I think it is. It must be. There
17. were quite a few people there that uh
18. were first generation, and couldn't
19. understand what I was saying. And the
20. younger people would help them out, and
21. explain to them what I was trying to get
22. them to taste. And there were some young
23. people that were really funny and I was
24. really enjoying myself. But he made a
25. comment, and I didn't catch what he said
26. because there was a woman walking right
27. towards him, and he said, "Did you hear
28. that?" He said, "That's why you didn't
29. sell very many."

C1

C2

C1

INTERRUPTION RELATION (C1 - C2)

RETURN RELATION (C1,C2 - C1)

(2) Something the speaker has been meaning to tell the listener, but has forgotten, can lead to a digression. For example, "Oh I forgot to tell you, your father called last night and he said to tell you...", where the speaker is reminded of this by a phone ringing. (3) An external event can lead to a digression if it either disrupts one's line of thought or warrants immediate attention, for example, the doorbell ringing.

Subissue and Joining Relations. The Subissue Relation is a relation between two issue context spaces mediated by at least one event context space. It is represented by the relation between (1),(2) and (3) below. The Joining Relation

is represented by the relation between (1),(2),(3), and (5) below. The joining of the issues in (1) and (3) in (5) is necessary to indicate that (3) stands in such a relation with (1),(2), and that what is taking place is not merely an Interruption Relation. The Joining Relation creates a single composite issue of two separate issues of concern. It says that the second issue is not tangential to the first, but that the first issue is contingent upon the second (e.g., the second causes the first). (The relation between (1) and (2), or (3) and (4), is an Illustrative Relation, and the relation between (2) and (3) is a Generalization Relation.)

(1) Issue context space
(2) (Event context space that exemplifies the issue of (1))+
(3) A new issue context space whose issue is common to the event context spaces in (2) and is different from that of (1)
(4) (Event context space that exemplifies the issue of (3) alone)*
(5) The issue of the context space in (1) and the issue of the context space in (3) combined into one issue of concern in either a new issue context space or the last event context space cited in (2)

An example of a Subissue Relation is the relation between issue context spaces C1 and C4 in Excerpt 3. P's tendency to notice unpleasant situations and yet not begin to feel responsible for them are joined on line 55, "I noticed it but I didn't start feeling guilty about it."

Respecification Relation. The Respecification Relation is represented by the relation between (1),(3) and (4) below.

(1) Event or Issue context space fully specified
(2) (Event or Issue context space that stands in one of the previously defined context space relationships with (1))*
(3) (Event or Issue context space that are unrelated, or related by only a single concept, to (1))*
(4) Event or Issue context space of (1) rediscussed

The major distinction between a Respecification and a Return is that in the Return Relation a speaker is obliged to return to the previous context space; in the Respecification Relation the returned-to context space has been fully specified and does not demand a return. It differs from the Restatement

Relation in that the Restatement Relation is used merely to restate and close the issue context space of an Illustrative Relation. Its function is to mark the termination of the influence of this issue context space on succeeding statements. The Respecification Relation marks the beginning of an issue or event context space's influence on succeeding utterances rather than the termination of such of an influence.

There are three possible forms for this relation: (1) Simple Respecification. This occurs when an event context space is abruptly closed so that a new but connected thought may be stated. In such a case a speaker may feel the need to repeat the initial context space, (1), though s/he does not add anything new to it in the respecification. An example of this is the respecification of context space C2 on lines 34-37 of Excerpt 1. (2) Contrastive Respecification. In this case (1) is respecified to contrast it (or relate it) to (3). In such a case there is an overlap of entities or topics between (1) and (3). An example of this is the respecification of context space C6 in Excerpt 2 in terms of the last issue discussed between P and F. (i.e., P's assessment of her progress in reacting to unpleasant situations with people in general.) As a second example, I return to the conversation from which Excerpt 2 was taken.

(1) Event Context Space: A store manager being discriminatory to Portuguese customers.
(2) A Generalization Relation: Issue Context Space: The tendency of working class people to be discriminatory.
(3) Issue Context Space: A negative experience with a group of people from one class causing one to dislike that entire class of people - related to (1) by the concept 'prejudice' but not cited in connection to the events in (1).
An Illustrative Relation: Event Context Space: A woman having a negative experience with a group of children resulting in her dislike of all children.
(4) (1) Respecified to discuss whether the people involved had been doing anything unpleasant to cause the store manager to have a negative experience.

(3) New Perspective Respecification. Sometimes an event context space is brought up to demonstrate one particular issue, as is the case in an Illustrative Relation. As a result, a speaker may not feel it appropriate to discuss other aspects or issues connected with the event context space at that particular time. However, after the initial issue under discussion has been exhausted, the speaker may then feel free to reintroduce that context space and discuss the other issues connected to it. In this case there would not be a connection between (1) and (3), and (3) would not be needed.

Total Shift Relation. This is the relation between two context spaces where the succeeding context space introduces a new topic. The succeeding context space is introduced when all previous topics have been exhausted. Often the new topic will involve entities from the previous context space but this is not necessary.

The following excerpt demonstrates a number of these relations.

-EXCERPT 3-

P: I think a lot of progress has been made, not a lot - Progress has been made, even in my not being overly sensitive anymore to people's hangups, you know. If I see someone being totally insecure it's not my fault, you know, and I don't get that super involved in it. That - I'm actually referring to something last night. This girlfriend of mine, Debbie, was over and we were talking and I think I interrupted her, but I'm not sure, I'm really not sure if I did or not. But all of a - But anyway, all of a sudden her face took on all these funny ki - she shows her emotions - took on these funny features in a way. And I noticed it. And a couple of weeks ago, months ago, I would've felt very guilty. What did I do wrong, etc. etc. And this time I didn't. And I just finished what I was saying, you know? And then - I might have interrupted her I'm not sure though - and

C1

C2

FULL ILLUSTRATIVE RELATION (C1 - C2)

23. then I said, "What were you saying?", and
24. not getting into, "Why are you upset,"
25. and "Oh I'm really sorry if I interrupted
26. you." 'Cause if I interrupted her it's
27. all right too. I can interrupt once in a
28. while. And I didn't get into her
29. hangups, or her feelings of insecurity.
30. Um, I was aware of it but I didn't start
31. feeling guilty myself. You know, like
32. with - when I went to the movies with
33. Cindy and Bob and I felt she was ignoring
34. him. I noticed it, I really think like I
35. notice these things maybe more than other
36. people, which isn't even good. I mean
37. Cindy didn't even know. I mentioned it to
38. her afterwards - remember when I thought
39. she wasn't talking to him? I mentioned
40. it to her after the conversation. I
41. don't know - I said, "Oh you know I said
42. something about you today." Because I
43. had a tape, and I was listening to the
44. tape, and she goes, "What tape is that?"
45. And then I said, "It's for school." And
46. she went out. And then I said, "Actually
47. you want to hear something?" And I
48. played her that first part where I talked
49. about her. And then she goes, "Oh
50. really?" And she goes, "I was ignoring
51. him?" And she wanted to get in this
52. whole trip about how she was ignoring
53. him, what she was doing, which I didn't
54. really feel like getting into. But, uh,
55. yeah, even there, I mean I noticed it but
56. I didn't start feeling guilty about it.
57. So there's some progress but not enough.

F: 58. But you said you were concerned that I
59. would be disappointed. Yet it sounds
60. like you learned something through that
61. experience of having called.

C2

C3 — *REFERENCE ILLUSTRATIVE RELATION (C1 - C3)*

C4 — *GENERALIZATION RELATION (C2,C3 - C4)*

SUBISSUE RELATION (C1,C2,C3 - C4)

C5 — *FULL ILLUSTRATIVE RELATION (C4 - C5)*

C3 — *JOINING RELATION (C1,C4 - C3)*

C1 — *RESTATEMENT RELATION (C1,C2,C3 - C1)*

C6 — *CONTRASTIVE RESPECIFICATION RELATION (C6,C1 - C6)*

(note: previous discussion of C6 not included)

4. Some Elements Underlying Coherent Conversations

The idea of hierarchically structured context spaces is useful in identifying and explaining several mechanisms for maintaining coherency in conversations.

4.1 Topic Discernment

The notion of 'topic' used in this analysis is equivalent to the one that denotes the relationship that holds between a title and the passage that the title applies to. This is the relationship that elementary school students are expected to employ in reading comprehension exams when requested to choose an appropriate title for a passage. While a passage usually has many possible titles, based on its context, some of these topics will be more appropriate than others.

4.1.1 Conversational Coherency -- Topic

The two major tasks confronting a listener are integrating succeeding utterances with preceding ones and understanding the point being expressed by a speaker's utterances. A smooth and coherent conversation from the viewpoint of the listener is one in which s/he can fulfill both tasks easily. As the studies of Bransford & Johnson (1972, 1973) illustrate, it is easier for people to comprehend utterances if they begin their processing with some notion of their underlying topic. Their studies also demonstrate that given such a topic, listeners will interpret utterances in reference to this topic and will have difficulty in understanding utterances tangential to it.

Each type of context space relationship has an associated set of rules that identify the type of utterances that are appropriate in its constituent context spaces. These rules are a formalization of some of the expectations that listeners seem to create for themselves so as to be able to easily integrate and understand a speaker's utterances.

The listener will feel that s/he has correctly integrated a new utterance if it lies in the same context space as the preceding utterances do or if s/he can determine the relationship between the context space in which the new

utterance lies and the context space in which the preceding utterances lie. A topic is associated with a context space which covers all the utterances within it. If a new utterance lies within the same context space as previous ones, the proposed topic will cover this new utterance. If it does not the listener has two alternatives; s/he can change the topic of the preceding utterances to one which will cover the new utterance as well, or decide that the new utterance lies in a different context space. If the listener can find an alternative topic to cover both the preceding utterances and this new one, then s/he will change the topic of the context space to this alternative topic. This would constitute integrating the new utterance with preceding ones. If, however, there is no topic that will cover all the utterances, a context space transition has occurred. The listener will then attempt to determine the relation between the old context space and this succeeding one by using her/his knowledge of possible context space relationships. Having found a relation, s/he will use the expectations s/he has associated with it to generate an appropriate topic for the succeeding context space. Succeeding utterances will then be processed in terms of this new topic.

For example, in the context of a Full/Reference Illustrative Relation (i.e., after an issue context space has been specified, a speaker beings the discussion of an event context space), a listener will expect the event context space to exemplify the issue under discussion and will therefore hypothesize that the topic of this narrative will be an 'instance'(8) of the issue of the issue context space.(9)

---

(8) A is an 'instance' of B if it is a particular member of the class that corresponds to the generic description, B.

(9) Labov & Fanshel (1977) similarly note that the 'evaluative point' (i.e., topic) of a narrative (similar to the notion of an event context space) is often a preceding 'general proposition' (i.e., the issue of an issue context space).

4.2 Semantic Relational Rules

4.2.1 Structural Considerations

An appropriate succeeding utterance in light of preceding ones on the part of a speaker is one that a listener can easily integrate with the preceding utterances. A listener integrates utterances by using her/his knowledge of possible context space relationships. Therefore, when a speaker's utterance results in a context space transition, the succeeding context space should stand in one of these known context space relationships with preceding context spaces for the utterance to be appropriate. In Appendix B a number of 'Semantic Relational Rules' have been formalized that define appropriateness in terms of the above criteria. SEM 1 is an example of such a rule.

(SEM 1) After the specification of an event context space, it is appropriate to discuss one of its points in general terms, i.e., create an issue context space (A Generalization Relation); unless: (1) the event context space has been brought up specifically to illustrate a separate issue of concern, and the new issue being highlighted is not a subissue of this initial issue; or (2) a second issue context space has been introduced and not yet fully discussed. (Note that this does not imply that the event context space under discussion was introduced in connection with this issue context space.)

4.2.2 State Considerations

It is a speaker's obligation to state her/his remarks in such a manner that a listener can at all times discern their underlying topic. It has been shown that a listener accomplishes this task by noting the relationship of the present context space to preceding ones in the conversation and using certain expectations s/he has associated with each type of context space relationship. In developing a context space, a speaker must take these expectations into consideration so that a listener will not have difficulty in integrating utterances.

Just as speakers must take into account their listeners when deciding on the content of a succeeding utterance so, too, a listener must take into account the speaker when s/he responds. An appropriate response on the part of a listener is one that adheres to the topic brought up by a speaker and those items upon which the speaker is focusing. A listener can determine these items by recognizing the relationship of the context space developed by a speaker to preceding context spaces in the discourse.

To capture this influence of preceding context spaces on what may be said within a context space under discussion, five states have been distinguished. A context space may be in any one of these states at a given time in the conversation. Below the five states are defined and some examples of Semantic Relational Rules specified in terms of these states are given.

Active: A context space under discussion. There can only be one active context space at a given point in the conversation.

Closed: A context space that was previously discussed and fully specified. (10)

Open: A previously active context space that was interrupted before completion by the introduction of a new active context space.

Controlling: If, at a given point in the conversation, the active context space is an issue context space and a speaker then introduces an event context space to exemplify the issue of this issue context space, then the event context space introduced becomes the active context space and the issue context space is assigned a 'controlling' state.

---

(10) My notion of 'fully specified' corresponds to the intuitive notion of a completed story, i.e., one that has reached a conclusion and is not left dangling.

Generating: If, at a given point in the conversation, the active context space is an event context space and a speaker then introduces an issue context space whose issue is a generalization of one of the event parts of this event context space, then the issue context space becomes the active context space and the event context space is assigned a 'generating' state.

As each new context space is entered, it is assigned an active state. At the same time, the states of previous spaces are reassigned based upon their relationship to the new active context space. The rules for these assignments are given in Appendix A.

Having distinguished between these states we can now formalize a number of Semantic Relational Rules in terms of them. A complete list of such rules are given in Appendix B. Three of these rules are illustrated below.

(SEM 8) An open context space demands completion immediately after the digression has been concluded unless: External events prevent this; in the interim a new context space has been given an open state status (The context space most recently left open places the highest demand for a return.); much time has elapsed since the context space first became open. The strength of the demand of returning to an open context space is inversely proportional to the length of time for which the context space has such a status. The longer a context space is left open, the lower its influence on succeeding statements and the lower its chances of being returned to.

(SEM 12) In the presence of a controlling context space, elaboration upon any event part of the event context space that is not an instance of the issue of the controlling context space is inappropriate and constitutes a digression.

(SEM 13) In the presence of two controlling context spaces (i.e., a Subissue Relation), the joining of the issue of the last controlling context space to the issue of the first controlling context space is required, i.e., it would be inappropriate to have the subissue supersede the initial issue under discussion resulting in the abandonment of the initial issue.

SEM 8 is illustrated by the immediate return to C1 in Excerpt 2, after C2 has been concluded; it is due to SEM 12 that context space C2 of Excerpt 2 is

an interruption context space, despite the fact that it describes event parts that occur in the same episode as the event parts of C1; and SEM 13 is illustrated in Excerpt 3 by the joining of the issues in C1 and C4 in context space C3, and the respecification of C1 on line 57.

4.2.3 An Example Of The Use Of Semantic Relational Rules To Maintain Coherency

The following excerpt demonstrates violations of some of the Semantic Relational Rules noted above and the resulting dynamics of such violations within a conversation. It demonstrates that since interruptions are basically inappropriate, they are highly rule governed and only tolerated up to a point. The excerpt also illustrates a case where the parties of the conversation have different priorities, context space structures, and focus level assignments. It demonstrates the initial speaker's use of some of the conventions noted above to assert her right not to follow the responder's shifts in focus level assignments and context space formations.

-EXCERPT 4-

A:	1.	It is like walking on eggshells, it	C1
	2.	really is. Um, I remember <u>what happened</u>	
	3.	<u>in January</u>. I went home and I, um, was	
	4.	with my cousin, he's my age, I've	
	5.	mentioned him before. We were in his	
	6.	apartment, and um we were talking. I	C2
	7.	just casually asked how my mother was	
	8.	doing, 'cause I hadn't - you know I	
	9.	wasn't involved. I didn't know what was	
	10.	happening. And he goes, 'Oh I think	
	11.	she's depressed.' This is before she	
	12.	changed - she had this whole fiasco with	
	13.	a job. She never liked her position in	
	14.	her job, which was a big part of her	
	15.	stupid problem, that she never changed	
	16.	it. <u>Oh I didn't tell you, when I was</u>	
	17.	<u>home a couple of - about two months ago.</u>	C3
	18.	I was really angry 'cause I know how much	
	19.	she's suffered 'cause she hasn't had a	
	20.	career - or feelings of inferiority. And	
	21.	here I'm doing it and she's trying to	

FULL ILLUSTRATIVE RELATION (C1 - C2)

INTERRUPTION RELATION (C2 - C3)

22. stop me. And so, you know, I get so
23. angry, and she was sitting and talking
24. how important it is to have a career and
25. to be able to do what you're doing. And
26. I was just sitting in the living room
27. dying, really getting angry. But I
28. didn't say anything, which I thought was
29. progress that I didn't say anything.] *C3*

B: 30. Is it?] *C4*

GENERALIZATION RELATION (C3 - C4)

A: 31. Oh it was progress, 'cause I used to get
32. into stupid arguments and fights with
33. them.] *C3*

B: 34. But isn't it hard work, to keep all that
35. in?] *C4*

A: 36. But it was better. Because I would get
37. into arguments with them, and it wouldn't
38. help. What would I do? Just scream or
39. say, 'How could you say you want' - I
40. would have gotten into an argument.] *C3*

B: 41. There might be something between an
42. argument and saying nothing.] *C4*

A: 43. Yeah, but that wasn't *(reference to C3)*

B: 44. Not to feel like you're bursting your
45. gut.] *C4*

A: 46. Yeah. That wasn't even that bad, that *(reference to C3)*
47. was just a thing. But anyway, I went
48. home in January and he told me that she] *C2*
49. was upset.

RETURN RELATION (C2,C3 - C2)

On line 16, A interrupts her discussion of context space C2 and begins discussing context space C3, an event context space related to C2 by the concepts, 'job' and 'A's mother'. On line 30, B begins issue context space C4, indicated by her switch to present tense. The issue highlighted in C4 is a generalization of the event part of context space C3 where A does not express her anger to her parents about their attitude about her work. Note that the introduction of C4 by B is a violation of SEM 1 as issue context space C1 has not yet been closed. In the lines which follow, A refuses to sidetrack onto

this new issue, and will only oblige B in so far as discussing the issue as it pertains to context space C3. A's main concern is to return to context space C2 which she has left open (SEM 8). The respective state and focus assignments for A and B at this point in the conversation are as follows. B has context space C4 as active, and its issue has a high focus level (cf. SA 2 and FL 2, that are discussed in the appendices). A has not entered context space C4, and for her context space C3 is still active. She is discussing an event part of C3 that for her has a low focus level (cf. FL 15 in appendices) in deference to B. On line 43, A indicates with the use of the deictic expression 'that', that she has closed context space C3 for herself. ('This' refers in general to something in the active context space, whereas, 'that' refers to something in a closed context space.) On line 47, A returns to the open context space, C2, which now becomes the active context space for both A & B.

4.3 Determining Focus Levels

A major component of deciding upon a topic of a group of utterances is determining the items upon which the speaker is focusing. They need to be distinguished from items that are mentioned in a context space merely as vehicles through which to convey a thought. In order to capture such a differentiation, a set of Focus Level Rules have been developed that assign a 'focus level' to each constituent of a context space (i.e., actors, objects, events/issue, location, time, and duration period).

'Focus' is a function of two arguments, where the first argument is a context space entity and the second a specified time in the conversation. This function, based on context space relationships, measures the attention given to the entity at the specified time. I would like to stress that my use of focus does not correspond to an item's place in active memory. Rather, I mean it to

be a more global concept which refers to the priority of (or overall importance given to) an entity vis-a-vis the conversation as a whole. As a result, it is possible that an entity is assigned a low focus level despite its repeated mention in the active context space. I have chosen an arbitrary classification of focus into four categories, high, medium, low, and zero, called focus levels, that are approximations of cutoff points along an underlying continuum of focus. The resulting assignment of focus levels has some correspondence to one's intuitive notion of an entity's degree of importance in a narrative or to an issue. However, the strength or utility of the set of Focus Level Rules does not depend upon this correspondence, but rather on its usefulness in determining the syntactic and semantic relational rules which seem to govern conversational speech.

The assignments are from the speaker's perspective. The default assignments for the listener are those of the speaker, unless the listener's succeeding utterances indicate otherwise.

4.3.1 Conversational Coherency -- Focus Levels

It is very important to realize that the focus level measurements of the entities within a conversation are subjective evaluations, and that the parties within a given conversation do not necessarily make the same evaluations. As a conversation proceeds each party is building up a model of the conversation. Such a model includes the conversation's context space structure and associated states, a notion of the present topic of discourse, and a list of items being presently focused upon. An important factor upon which the smoothness and coherency of a conversation depends is the lack of conflict between the respective models of the participants.

Partaking in a conversation obliges one to be sensitive to the items with which the second party is concerned. In the role of responder, one is often required to suspend discussion of one's own interests, and discuss those that the last speaker has brought into focus. If a person is unwilling to make this adjustment, then all parties will inevitably be frustrated and talk at cross purposes. Taking turns can be thought of as alternating between the roles of speaker and responder. As speaker a person indicates what items are in focus for them, while the appropriate action of the responder is to continue to discuss those items which the speaker has brought into focus.

In Appendix C the Focus Level Rules are presented. Using these rules, a listener can determine the focus level assignments of the items introduced by a speaker in a context space. The rules are based on the relationship of the active context space to preceding context spaces. The focus level assignments of the entities making up these previous context spaces are also affected by the new context space. These effects are specified in the appendix in terms of their new states. FL 3 and FL 4 demonstrate the effect of a state assignment on a context space on the focus levels of its constituent entities, while FL 6 demonstrates the effect of the type of context space relationship that occurs on the focus levels of the new active context space.

Closed:

(FL 3) When a context space is closed, all of its constituent entities receive zero focus levels.

Open, Controlling & Active:

(FL 4) The constituent entities of an open or controlling context space retain their focus level assignments throughout the time that the context space has such a status. All cited entities of an active context space are initially assigned low or medium focus levels (depending upon whether they are referred to by name or description), except those that are part of an open or controlling context space. The initial focus level assignments for these entities are those which they have in the open or controlling context space.

An Illustrative Relation:

(FL 6) All events in the event context space in an Illustrative Relation (called a "subspace" of the initial issue context space), that are not instances of the issue in the issue context space are assigned low focus levels as these events merely serve as props or background to the point being made.

The speaker's speech reflects an entity's focus level. One of the factors facilitating conversational smoothness and coherency is the correspondence between these linguistic indicators and the assignments predicted by the Focus Level Rules. Faced with an inconsistency a listener has a number of options. One such option is for the listener to reasses her/his assumptions of the speaker's focus of attention and to reconstruct her/his model of the discourse so that it will coincide with the speaker's.

One of the linguistic mechanisms by which speakers indicate their focus level assignments is their use of pronominal reference. An item with a high focus level will be referred to by pronominal form, whereas an item with a low focus level will be repeatedly referred to by name or description. A second such mechanism is the use of deictic expressions. 'This' refers to something in the active context space, whereas, 'that' refers to something in a closed context space.(11)

The following excerpt demonstrates an example of conversants having different focus level assignments and their use of these two linguistic mechanisms to indicate this.

-EXCERPT 5-

G: 1. So I said, 'Let me tell you about my
2. chess game.' And he goes, 'You don't do
3. what I want you to do so I'm not
4. interested in anything you do.' ('HE'
5. REFERS TO G'S BROTHER) And so I said,
6. 'Oh,' and we just hung up the phone, you

(11) C. Bullwinkle (1977) notes a similar use of 'this-that' in terms of topic.

7. know. And then my sister called me back
8. and I didn't tell her I was angry. I
9. didn't say anything, but I guess she
10. knew. She said, 'Why'd you hang up?'
11. And I said, 'I thought we had said our
12. goodnights.' Because sometimes she gets
13. involved and then she becomes the victim,
14. right? And I didn't want to have that
15. happen.

B: 16. This was between the two of you.

G: 17. Between me and my brother, and I didn't
18. want her to get involved.

G initially focuses upon her brother and a disagreement that they had. Then, on line 7, she switches her focus and discusses her sister's role in the interchange. B's statement, however, indicates that she has not gone along with G's switch, and that she is continuing to focus on G's brother and G's argument with him. (This is strongly reflected in B's speech by her use of 'this' to refer to the argument, and her use of a pronominal reference, embedded in the plural personal pronoun 'you', to refer to G's brother.) It is G's response which is interesting. Despite the fact that it was clear to G what B was referring to in her phrase, 'the two of you,' G explicated B's statement. G's intonation pattern for the phrase, 'between me and my brother' (which is that of a statement and not of a question) confirms this fact. In addition, it would have been sufficient for G to use the pronoun 'him' to clear any semantic ambiguities; instead she used the full descriptor, 'my brother'. G did this because in her own discourse model her brother no longer had a high focus level. Her reintroduction of him in this manner is an indication to B that this was the case. Having made this point clear, G can now either follow B's lead and refocus on her brother or she can continue to focus on her sister whom she has not yet taken out of high focus. (This is indicated by G's continued pronominal reference to her sister on line 18.)

5. Linguistic Mechanisms

In studying the transcribed dialogues I observed certain regularities of speech that often accompany context space transitions. These regularities, I believe, are the linguistic tools used by speakers to indicate their model of the conversation. The following five mechanisms have been identified thus far:

1. Clue Word Shifts and Deictic Expressions
2. Explicitly Labelled Shifts
3. Mode of Reference
4. Repetition of Words
5. Tense Shift

5.1 Clue Word Shifts and Deictic Expressions

Recognizing the relationship that a context space has with preceding ones enables a listener to determine the states of the preceding context spaces and the focus levels of the constituent entities of the new context space. A listener then uses these assignments to determine what would be an appropriate continuance of the new context space. This recognition is not left solely to the listener's semantic capabilities; it is facilitated by a number of syntactic clues used by a speaker to indicate precisely what type of relationship is taking place. Among these mechanisms is the use of linguistic clue words. Simple words, that one hears everyday in conversation but probably does not pay much conscious attention to, such as "though", "but", "yeah", "incidentally", "anyway", "like", "when", and "so", are in fact words heavily loaded with information necessary for a smooth conversation. I have observed that each of the above words corresponds to a specific relationship occurring between a preceding and new context space.(12)

---

(12) This is not to say that each use of such a word signifies a context space transition. One must distinguish between when a word is being used to convey its usual semantic import and when it is serving as a context space shift mechanism. I assume that a semantic component would first test each word to see

Clue Word	Relation
(SYN 1) Like	Full Illustrative
(SYN 2) Like When	Reference Illustrative
(SYN 3) So	Restatement
(SYN 4) Incidentally	Interruption
(SYN 5) By the way	Interruption
(SYN 6) Anyway	Return
(SYN 7) (So/But) Yeah	Joining
(SYN 8) Deictic Expressions &Though	Contrastive Respecification
(SYN 9) But	Simple/New Respecification

For each clue word an illustration is presented below of it serving as a context space shift mechanism.

(1) Like

-EXCERPT 6-

F: 1. I'm starting to, you know, to get more
2. insight about dreams. And they're so
3. revealing about where you're at. They
4. really are. Like Susan and I spent an
5. hour the other night just dissecting her
6. dream.

C1

C2

FULL ILLUSTRATIVE RELATION (C1 - C2)

C: 7. I know. I should write them down. *(comment on C1)*

F: 8. And she wrote it down, and when I read it
9. I saw new things into it. And it was
10. just so interesting. And it really
11. reflected so much of where she's at in
12. therapy and everything.

C2

(2) Like When is used to introduce subspace C3 of Excerpt 3; "You know, like with - when I went to the movies with ...".

(3) So is used in the restatement of issue context space C1 of Excerpt 3 after the specification of a number of subspaces to it; "So there's some progress but not enough.".

---

if its ordinary semantic sense usage would apply in the given sentence. However, there are additional clues as to whether a word is being used in its semantic or 'shift' sense, (e.g., if it is combined with some other shift mechanism then it too is probably serving such a function). In addition, a cursory study of the tapes seems to indicate different intonation patterns for the shift and semantic senses of these words. At the present time, however, I am not prepared to formalize these differences.

(4) Incidentally is used to interrupt context space C1 of Excerpt 2, and to indicate the transition onto context space C2; "Incidentally, while I was standing there ...".

(5) By the way is used to interrupt context space C2 of Excerpt 1 and to indicate the transition onto context space C3; "By the way, when I was thinking about Albert ...".

(6) Anyway is used to return to context space C2, after the digression onto context space C3, in Excerpt 4; "But anyway, I went home in January and he told me that she was upset.". A uses 'but' in conjunction with 'anyway' to strongly close context spaces C3 and C4 for B. B's statements make it clear to A that B's focus of attention lies elsewhere. If a digression is prefaced with either the clues words 'incidentally' or 'by the way', then the clue word 'anyway' will not be used to indicate the return to the interrupted context space. Rather, the clue word 'but' with repetition is usually used. This is because these terms convey like information about the status of the context space that serves as a digression. The information conveyed by 'anyway' is: 'The statements that I have just uttered are tangential to my initial point which I will now return to.' The information conveyed by 'incidentally' and 'by the way' is: 'The statements I am about to make are tangential to my initial point.'

(7) But/Yeah is used on line 54 of Excerpt 3; "But, uh, yeah, even there, I mean I noticed it ...". P uses the clue word 'but' to close context space C5 and uses the clue word 'yeah' to join the two issues into one joint issue in the last generating context space -- C3.

(8) Deictic Expressions P uses the deictic expression 'there' as a reference point to context space C3, Excerpt 3, in her respecification of it in terms of both the initial issue of concern and the subissue (cf. 7 above).

(9) But is used to close context space C4 of Excerpt 1, and to indicate the respecification of context space C2; "But that's what I said, I said ...".

A clue word may perform three tasks:

1. Indicate a context space transition
2. Reflect on the state of the preceding context space
3. Indicate which context space is to follow (e.g., a previously discussed context space or a new one)

While all three tasks are performed by each clue word, some of the clue words express these functions more strongly than others. In particular, the clue word 'anyway' best performs function 3 (i.e., it says that the succeeding context space will be a resumption of the last one left open as a result of the digression), while the clue word 'but' best performs function 2 (i.e., it strongly closes the preceding context space). Therefore, a speaker will often use two clue words in conjunction with each other. In such a case the word that best specifies the function is used. For instance, a Return Relation is often specified by the term, 'but anyway', where the clue word 'but' is being used to emphasize the close of the digression and 'anyway' is being used to specify the return to the interrupted context space.

An appropriate response on the part of a listener to a speaker's utterances is one that concerns the topic of these utterances and those items which are shown to be in high focus. Sometimes, however, a person will want to discuss something even if it is not in high focus. A linguistic mechanism that a speaker can use to do this, i.e., that will transform an otherwise inappropriate remark into an appropriate one, is to preface the comment with the clue word 'but'. In these cases, one could paraphrase the information that 'but' carries as: "I, the speaker, know you, the listener, are focusing on X. Despite the fact that X may warrant further discussion on my part, or your desire to focus on it, I wish to return to a different issue of concern." This is analogous to

a game situation where it would be inappropriate for players to merely walk off the field but it is all right if they first call "Time".

Similarly, the clue words, 'anyway', 'incidentally', and 'by the way', enable speakers to inappropriately shift the focus of the conversation without causing undue disruption. A coherent conversation is one where the topic and items being focused upon are clear at all times. Digressions threaten conversational coherency because just as these items have been implicitly agreed upon by the participants, the assignments are suddenly switched. Because digressions are so disruptive there are many conventions that people use when they do digress. Some of these conventions are noted in the Semantic Relational Rules (SEM 7 & 8). The accompaniment of digressions with such clue words as, 'anyway', 'incidentally', and 'by the way', are some of these other conventions. One could paraphrase the information carried by such terms as, 'incidentally' and 'by the way', with the following apologetic statement on the part of the person causing the digression: "I know that we've just agreed to talk about X, and have thereby established a topic of discourse and the items that we're going to focus on. But just for the moment, please bear with me and suspend all these assignments. Let me establish some new ones because I really want to tell you about Y before we go on with X." With the clue word 'anyway' the apology follows the act and is used to reestablish the old assignments between the participants .

5.2 Explicitly Labelled Shifts

A speaker will sometimes preface a context space shift with a full phrase to that effect. Some of the phrases that were used in the dialogues studied were:

What I was saying before
Speaking of X
Remember we were talking about X
Oh I didn't tell you that X
Tell you one other thing first

While this mechanism is neater and more explicit than the clue word shift it occurs less frequently. This is contrary to written text. This is probably because people are clearer and more precise in written text than in oral speech. Written text usually presupposes minimal contextual knowledge on the part of a reader and thus requires less cross-referencing work.

5.3 Mode of Reference

A major syntactic mechanism that speakers use to indicate their focus of attention is the mode of reference that they choose for the entities of a given context space. In analyzing transcribed dialogues, I found it more revealing to ascertain why, in a place where it would normally be expected, a pronoun was not used, rather than to study pronoun resolution. In answering this question I found that a strategy governs the use or non-use of pronouns, and I was able to identify a number of abstract rules, intricately bound to the theory of conversation being presented here, that seem to govern intersentential pronominalization.

(SYN 10) Within a given context space, actors with high focus levels are referred to by pronominal form.

(SYN 11) Within a given context space, all actors who do not have high focus levels will not be referred to by pronominal form. This will be true even for an entity that is frequently referred to within sequential utterances (i.e., if this entity is not in high focus it will be repeatedly referred to by name or description).

It is due to SYN 11 that the pronominal form is never used for Albert in context space C3 of Excerpt 1; "By the way, when I was thinking about Albert, I was thinking about how I would think about Albert, years from now. You know, look

back upon it and what context Albert would fit in my life.". This rule is also illustrated by context space C5 of Excerpt 3; "And she was ignoring him. I noticed it, I really think like I notice these things maybe more than other people, which isn't even good. I mean, Cindy didn't even know.". Notice that Cindy is reintroduced here, despite the fact that she was just referred to by pronominal form in a preceding utterance (lying in context space C3). However, she was only in high focus vis-a-vis C3, based on rule FL 7 (cf. Appendix C). A third example of an entity's mode of reference being dependent upon its focus level is illustrated in the following excerpt where violations of these syntactic rules result in ambiguities and confusion.

-EXCERPT 7-

C: 1. I bought one of these for Arthur. It's soap.

F: 2. Oh that's nice.

C: 3. He really wanted to get a soap and a dish but he doesn't want to
4. get one when he lives with Wilson, 'cause Wilson has one in our
5. bathroom, and anything about Wilson really bothers Arthur. He
6. doesn't want to get one because Wilson has one.

F: 7. Does he still spend a lot time there?

C: 8. Wilson? No, no not really, he's not there very often.

F's pronominal reference to Wilson confuses C as her focus of attention is on Arthur, rather than on Wilson. This is demonstrated by her continual pronominal reference to Arthur and none so for Wilson. (C's nonpronominal reference to Arthur on line 5 can be explained by the presence of a second male actor within the same sentence.)

(SYN 12) If the focus level of an actor has been shifted from a high focus level (by way of FL 22 or 23) within a single context space since the last reference to the actor, the next reference to this actor will not be in pronominal form.

The following excerpt illustrates this rule.

-EXCERPT 8-

P: 1. What happened, her boy friend from
2. Holland, ('HER' REFERS TO A WOMAN NAMED
3. TAMMY) - they just left today as a matter
4. of fact, but we've been spending the past
5. couple of days together, no just evenings
6. at home - and somehow they got into this
7. discussion about Americans. And they
8. were still doing it. And this - his name
9. is Tom - and he said something, "Oh yeah, *SHIFT IN FOCUS FROM TAMMY TO TOM*
10. Americans are so open. The minute they
11. meet you they tell you their whole life
12. history." And I was getting very upset
13. because despite everyone saying that -
14. and even her own, Tammy's own saying -
....

(SYN 13) By the time an entity is referred to with a pronoun it must already be in high focus, unless, the entity is referred to as the agent of an event and s/he by this time is in medium focus.

(SYN 14) If a conversant mentions an actor that is not well known to the listener s/he will initially introduce the actor by description. If the speaker wants to focus on the actor, s/he will then cite the actor's name as well. If, however, the actor does not play a major role in the context space, s/he will not be named. Under these circumstances (i.e., where the entity is not well known to the conversants), an entity referred to by description has a low focus level; by name a medium focus level; and by pronoun a high focus level.

Excerpt 8 demonstrates a speaker's speech reflecting an actor's shift along the focus continuum from low to high: Tom has an initial low focus level as reflected in P's use of the description, 'her boy friend from Holland' to refer to him on line 1. On line 9, however, P wishes to discuss an event part of the episode with Tom as the agent of the event. Doing this would bring him into high focus (FL 23). P's statement on line 8, 'his name is Tom' enables P to do this by bringing Tom into medium focus. From a medium focus level, Tom can then be taken into high focus (SYN 13), as reflected by P's next reference to Tom by the pronominal form.

The following are some of the consequences that hold as a result of these syntactic rules and the focus level algorithm specified earlier.

1. A Total Shift Relation demands that the entities of the new context space be initially referred to by name or description -- not by pronominal form. This is the case even if the last reference was in an immediately preceding sentence, but not in the same context space. (cf. SYN 13 above and FL 21 in Appendix C)

The above explains the need for the reintroduction of Albert by name in context space C4 of Excerpt 1. A Total Shift Relation that results in an entity being referred to by name after s/he had been referred to by pronominal form in the preceding context space is shown in the following excerpt.

-EXCERPT 9-

D: 1. The first time it happened I felt very
2. embarrassed. Because that must have been
3. an uncomfortable feeling for her. ('HER' REFERS TO A WOMAN NAMED SALLY WHO IS THE MAIN ACTOR WITH WHICH THIS CONTEXT SPACE IS CONCERNED.) — *C1*

S: 4. And you can't even pick up for her
5. because you have no idea where she
6. stopped. — *C1*

D: 7. And I don't want to say, "I'm sorry for
8. being so rude and not listening." But I,
9. uh, just let it happen. — *C1*

S: 10. What's the relation like between your
11. father and Sally now? — *C2*

TOTAL SHIFT RELATION (C1 - C2)

2. Actors cited in the succeeding event context space of a New/Simple Respecification Relation all demand reintroduction, so as to clearly establish which context space is being respecified. If, however, by the time an entity that had a high focus level in the initial discussion of a simple respecified context space is referenced, the context space has been firmly re-established, then that actor may be referenced by pronominal form. In a Contrastive Respecification Relation, entities that are being contrasted with the controlling context space may be referred to pronominally. (FL 20, SYN 13)

The speaker's pronominal reference to Carol on line 36 of Excerpt 1 is explained by the above qualification on the Simple Respecification Relation.

3. In an Interruption Relation, the concepts that triggered the digression, and which had high focus levels in the interrupted context space, do not need to be reintroduced in the digression context space. (FL 13, SYN 10)

A's continued pronominal reference to her mother in context space C3 of Excerpt 4 demonstrates Consequence 3; "Oh I didn't tell you, when I was home a couple of - about two months ago, I was really angry 'cause I know how much she's ...".

4. In an illustrative event context space, actors carried over from the preceding issue context space do not need reintroduction. (FL 8, SYN 10)

5. In a Return Relation, the actors that were in high focus before the digression do not need reintroduction. (FL 17, SYN 10)

Consequence 5 is illustrated in Excerpt 4; "But anyway, I went home in January and he told me that she was upset.".

6. In a Restatement Relation, the actor involved in the issue under discussion does not need a reintroduction. (FL 10, SYN 10)

Two major points of interest here are that the mode of reference to an entity can be used as an indication of the focus level of the entity for the speaker, and that it can be used as an indication of a context space shift.

The theory is also able to predict the linguistically legal combinations of clue words and modes of reference. For example, the clue word 'but' alone does not facilitate pronominalization, while the clue word 'anyway' does. The following excerpt demonstrates the clue word 'but' blocking pronominalization.

-EXCERPT 10-

A: 1. I think in a way that's what she does to
2. me, and I don't like it. So I try not to
3. do it to her. ('SHE' refers to A's mother.)

B: 4. But you said you have some feelings about
5. bringing up this whole topic of what goes
6. on between you and your mother. You said
7. because it was negative?

5.4 Repetition of Words

In the retelling of an episode, a speaker will often interject "side comments" into the mainstream of the story. These side comments do not result in context space transitions. Therefore there is a special mechanism to handle them. After the side comment has been completed a speaker will recommence the telling of the episode by repeating the words that s/he said immediately before the side comment.

-EXCERPT 11-

Prior:

Then I go "Oh you know, the one from school."

Side Comment:

Whenever I have to justify any of my relationships I go, "They're from school." And the reason I say it is to justify them, because, you know, otherwise they're not okay people.

Repetition:

So I said, "Oh the one from school."

In the above, repetition was sufficient as only a side comment was interjected by the speaker. Repetition, however, is not sufficient as a context space shift mechanism, since it is not strong enough to close an intervening context space. It can be used as such only when it is combined with certain additional mechanisms. For instance, a Simple Respecification Relation is sometimes prefaced with the clue word 'but' (which closes the preceding space) and a repetition of a significant phrase of the context space being returned-to (which indicates which context space is being respecified). When this happens neither mechanism is considered alone, so that, for instance, pronominalization in such cases is allowed. The respecification of C2 on line 34 of Excerpt 1 is accomplished by this means.

Within the same excerpt, however, there is a misuse of this mechanism as it is used on line 15 to return to context space C2, after the occurrence of an intervening context space -- C3. As a result, the passage does not read well at all. On first reading the passage, line 15 seems to be a continuation of C3 rather than a return to C2. It is only when one reads its succeeding line, 'That is what I said, and she said...,' that one realizes that the preceding line must, in fact, lie within context space C2, rather than context space C3. This supports the claim that repetition is not meant to be used as a context space transition mechanism. The reason that the speaker used it in this manner was so that C3 would in fact not be closed, as she wanted line 15 to apply both to C3 and C2 (her thought and verbal expression were the same - 'History will be kind to Albert.'). In a sense, the speaker at this point joined C2 and C3 into one context space, and for this reason she was able to continue to refer to Carol by the pronominal form on line 17.

5.5 Tense Shift

Tense seems to be a more locally used mechanism than the ones cited above. The time an episode occurred is one of the constituent entities of an event context space. An adverbial phrase such as "four years ago", or "last week" is usually used for the time specification of a past event. In the retelling of the actual episode, a speaker seems to mainly use the simple past tense. Thus, tense alone cannot be used to order past events from two different context spaces. However, events or issues occurring in the present can be distinguished from past events and issues by tense alone. To close a context space whose main event occurred in the past, it is sufficient for a speaker to switch from the past to present tense. Conversely, a switch in tense from present to past is sufficient to indicate the beginning of a new context space whose main event, or

issue of concern, took place in the past. The transitions in Excerpt 1 from C2 to C1, "It was just so funny - I am so afraid...", and from C2 to C4, "I realized that was the terms I put it in. That when - Because, it's true, ...", are accomplished by this method.

Reichenbach (1947) demonstrated that the tenses determine the time of an event in relation to three points in time. These three points are: the time of speech (S); the actual time when the event took place (E); and the reference point of the event (R). (R) is some point in time between (E) and (S) and can be thought of as that point in time where one's focus of attention lies. Within a conversation, one's focus of attention is on the active context space. I therefore believe that the reference point of an event is always the time specification of the context space in which the event is being discussed.

Reichenbach claimed that within a compound statement all constituent clauses must have the same reference point.(13) I believe that what Reichenbach stated for a single statement is true of a single context space as well. Statements lying within a single context space must all share the same point of reference (the time specification of the context space). One could therefore define a context space as being a sequence of utterances all of which have the same point of reference. A context space transition could then be defined as a shift in the reference point (unless a speaker explicitly states that the new reference point will be the same as that of the preceding context space by using a temporal connective such as 'while').

It would follow, therefore, that the introduction of events specified in the past perfect tense does not cause a context space transition. Since the

(13) This principle is stated in 'The Permanence of the Reference Point'. It is relaxed only for clauses which are combined by temporal connectives such as 'before', 'when', and 'after' ('The Positional Use of Reference Point').

reference point of these events is the time of the main event being discussed in the active context space, their introduction does not introduce a new reference point and, therefore, is not shifting one's attention onto a new context space.

The past perfect tense seems to be used in the description of background material relevant to the active context space, such as: "Pam was a royal pain. All right, so her boy friend had broken up with her, but that wasn't my fault." The speaker's use of the past perfect for Pam's breakup with her boy friend demonstrates that her focus of concern is not on this event; the only reason she introduced it was to help explain the events and actors of the active context space.

The past perfect is also used to order in time event parts of the episode being described in the active context space. A speaker will often switch from the simple past tense to the past perfect tense to cite an event part which had been left out in the retelling of the episode. The following excerpt illustrates this type of past perfect usage. The speaker's continued pronominal reference to an actor of the last active context space and her use of repetition to return to the item mentioned before the specification of the event in the past perfect, serve to support the claim that an utterance in the past perfect does not result in a context space transition.

-EXCERPT 12-

Prior:

And I said, "Well,"

Event In The Past Perfect:

Um, she had said something like, "If you're not going to be responsible about this maybe we should part our ways."

Repetition:

And so I said, "Well...."

6. A Process Model

Two of the primary tasks confronting a conversant are (1) appropriately responding to preceding utterances, and (2) integrating a speaker's utterance with preceding utterances. Underlying the accomplishment of these tasks is a conversant's ability to structure a conversation into related context spaces with associated states and to assign focus levels to each constituent entity of a context space. The following figures outline the process by which participants do this.

(1) Appropriately Responding To Preceding Utterances:

Content Of Response: Figure 1a. represents a small part of the process involved in deciding the content of an appropriate response to preceding utterances. A major element of such a decision process lies in identifying the preceding utterances that are relevant to the generation of a response. Relevant utterances are those in the active context space, and in the preceding context spaces that related to the active context space.

Using the notions of context space relationships and state assignments we can list and constrain the possible types of questions that conversants have to pose for themselves.

A controlling context space exerts an influence on what should be considered a legitimate response to a succeeding context space (e.g., a response that introduces a new issue of concern that is not a subissue of the initial issue is inappropriate - SEM 1). Thus, in determining an appropriate response, one must discover whether or not the active context space is being cited in the presence of a controlling context space. This question is represented by Configuration A of Figure 1a.

Given that the listener's discourse model does contain a controlling context space, the listener must question if the active context space is an

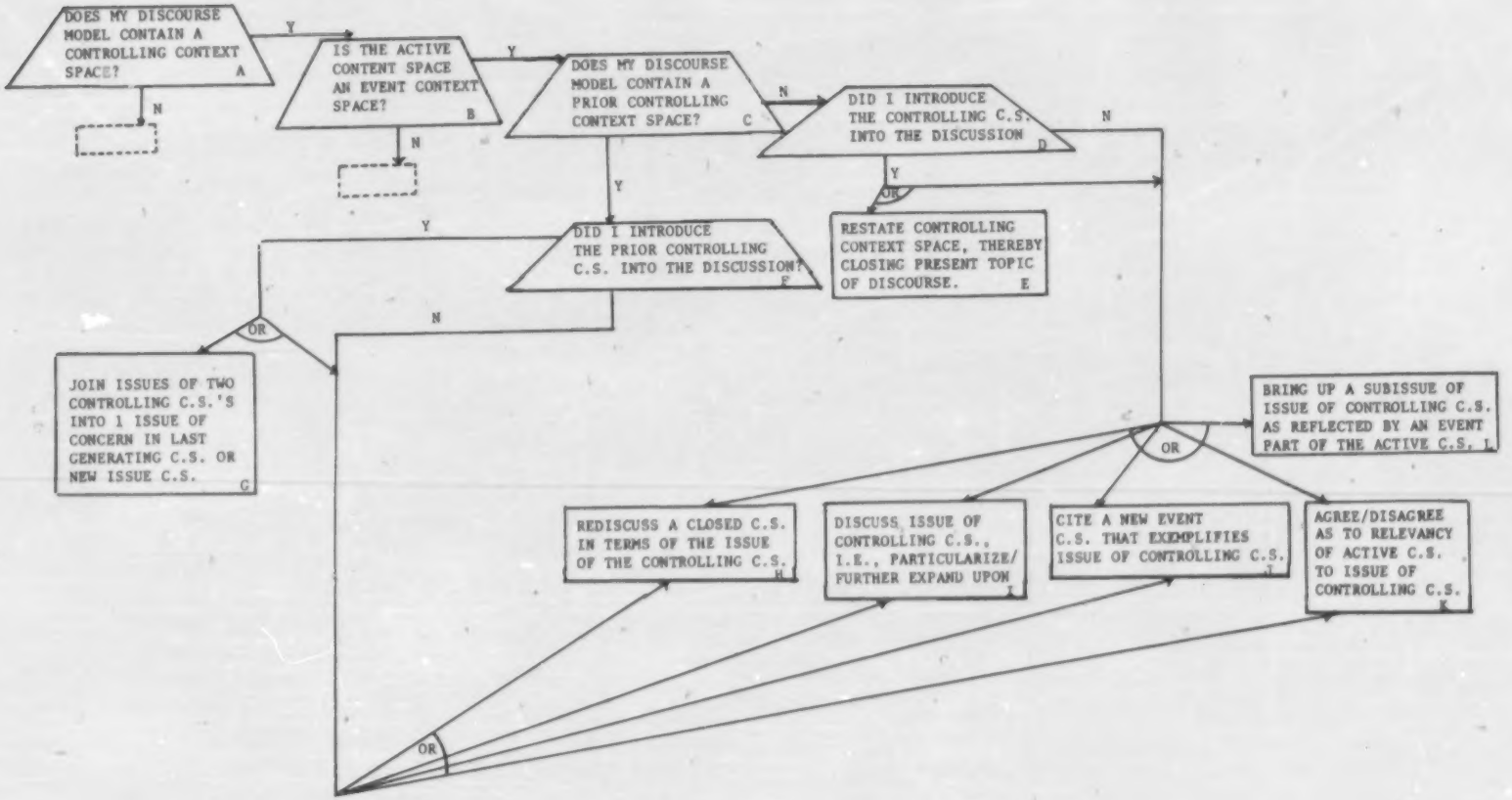
DOES MY DISCOURSE MODEL CONTAIN A CONTROLLING CONTEXT SPACE? A
Y
N
IS THE ACTIVE CONTENT SPACE AN EVENT CONTEXT SPACE? B
Y
N
DOES MY DISCOURSE MODEL CONTAIN A PRIOR CONTROLLING CONTEXT SPACE? C
N
Y
DID I INTRODUCE THE CONTROLLING C.S. INTO THE DISCUSSION D
N
Y
OR
RESTATE CONTROLLING CONTEXT SPACE, THEREBY CLOSING PRESENT TOPIC OF DISCOURSE. E
DID I INTRODUCE THE PRIOR CONTROLLING C.S. INTO THE DISCUSSION? F
Y
N
OR
JOIN ISSUES OF TWO CONTROLLING C.S.'S INTO 1 ISSUE OF CONCERN IN LAST GENERATING C.S. OR NEW ISSUE C.S. G
BRING UP A SUBISSUE OF ISSUE OF CONTROLLING C.S. AS REFLECTED BY AN EVENT PART OF THE ACTIVE C.S. L
OR
REDISCUSS A CLOSED C.S. IN TERMS OF THE ISSUE OF THE CONTROLLING C.S. H
DISCUSS ISSUE OF CONTROLLING C.S., I.E., PARTICULARIZE/ FURTHER EXPAND UPON I
CITE A NEW EVENT C.S. THAT EXEMPLIFIES ISSUE OF CONTROLLING C.S. J
AGREE/DISAGREE AS TO RELEVANCY OF ACTIVE C.S. TO ISSUE OF CONTROLLING C.S. K
OR

FIGURE 1a.

GOAL: TO DECIDE UPON THE CONTENT OF AN APPROPRIATE RESPONSE TO PRECEDING UTTERANCES.

event context space cited as an illustration of a main issue or a subissue under discussion (Configurations B and C, Figure 1a.). If it is an event context space exemplifying a subissue, as reflected by the presence of a prior controlling context space in the discourse model, the conversant can next consider whether or not s/he had brought up this prior issue context space for discussion (Configuration F, Figure 1a.). If s/he had, then s/he could feel free to return to the initial issue of discussion by joining the two issues into one composite issue in the last generating context space (Configuration G, Figure 1a.). Other alternatives in this environment (and the case where the listener had not begun the initial issue of discussion) are represented in Figure 1a. by Configurations H,I,J, and K. These configurations, and others of the figure not here cited, should be self-explanatory.

Form of Response: Having decided on the content of a response, a listener must still determine an appropriate form in which to state it. A conversant's process of integrating utterances is governed by the assumption that an utterance's relationship to previous ones will be reflected in the linguistic form of that utterance. The variables to decide upon are: choice of clue word; type of deictic expressions; tense; and mode of reference. Figure 1b. specifies appropriate linguistic forms for the responses decided upon in Figure 1a. (i.e., those cited in Configurations E,G,H,I,J,K, and L). The following specifies an appropriate linguistic form for the response decided upon above -- Configuration G, Figure 1a.

Configuration G: Preface the response with 'So/But Yeah', and return to the tense of the generating context space. (This will usually be the simple past tense, and therefore a tense shift will usually not occur in this kind of environment.) The pronominal form should not be used for first references to the entities of the generating context space (except for

Configuration E: Preface the response with the clue word 'So' and shift to present tense. Continue use of pronominal reference for high focus level entities of issue context space.

Configuration G: Preface the response with 'So/But Yeah', and return to the tense of the generating context space. (This will usually be the simple past tense, and therefore a tense shift will usually not occur in this kind of environment.) The pronominal form should not be used for first references to the entities of the generating context space (except for references to either oneself or one's conversant as actors in this context space). Deictic expressions such as 'there' and 'that', rather than ones such as 'here' and 'this', should be used for first references to entities of the generating context space.

Configuration H: Preface the response with the clue word 'But' and respecify the event part of the closed context space that exemplifies the issue of the controlling context space. Again, the pronominal form should not be used for first references, and deictic expressions such as 'there' should be used initially.

Configuration I: Return to present tense. All entities of the controlling context space in high focus may be referred to pronominally in the response. Deictic expressions such as 'here' and 'this' should be used.

Configuration J: Preface the response with the clue word 'Like', or 'Like When' if you've previously (on a different occasion) told this episode to your conversant and believe that s/he would remember it. First references to any entity in the new event context space that is not an entity of the controlling context space with a high focus level should not be in pronominal form, even if this entity appears in the last active event context space.

Configuration K: References to entities of the active context space that do not play a role in the issue under discussion should not be in pronominal form.

Configuration L: Shift to present tense. References to actors of the event context space that do not play a role in the controlling context space should not be in pronominal form, even if they have been referred to by pronominal form in the active context space.

FIGURE 1b.

GOAL: TO CHOOSE AN APPROPRIATE LINGUISTIC FORM FOR A DECIDED UPON RESPONSE.

references to either oneself or one's conversant as actors in this context space). Deictic expressions such as 'there' and 'that', rather than ones such as 'here' and 'this', should be used for first references to entities of the generating context space.

(2) Integrating A New Utterance With Preceding Utterances:

A listener will feel that this task is accomplished if a new utterance lies in the same context space as the preceding ones or if s/he can determine the relationship between the context space in which the new utterance lies and the context space in which preceding utterances lie. Thus, one of the first steps in the process of integrating utterances is to decide if the new utterance lies in the same context space as the preceding utterances.

In order to determine whether a new utterance lies in a different context space listeners can take advantage of the linguistic context switching mechanisms that are at a speaker's disposal. The first step of the process of integration will be to test the new utterance for a linguistic context switching mechanism. This step is represented by Configuration A of Figure 2. Figure 2 indicates the existence of different processes to be triggered, depending upon whether or not a context switching mechanism has been used, and, if so, which particular one was used. Only one of these processes will be discussed here: the process triggered by a tense shift as it is represented in Figure 3.

Tense Shift: A shift to present tense usually indicates a transition onto an issue context space. Given that the preceding context space was an event context space (Configuration A, Figure 3), it is necessary to determine whether the environment of this event context space already contains an issue context space (Configuration B, Figure 3). If it does, the first thing to check is whether or not the new utterance repeats or elaborates upon the issue of this issue context space (Configuration C, Figure 3).

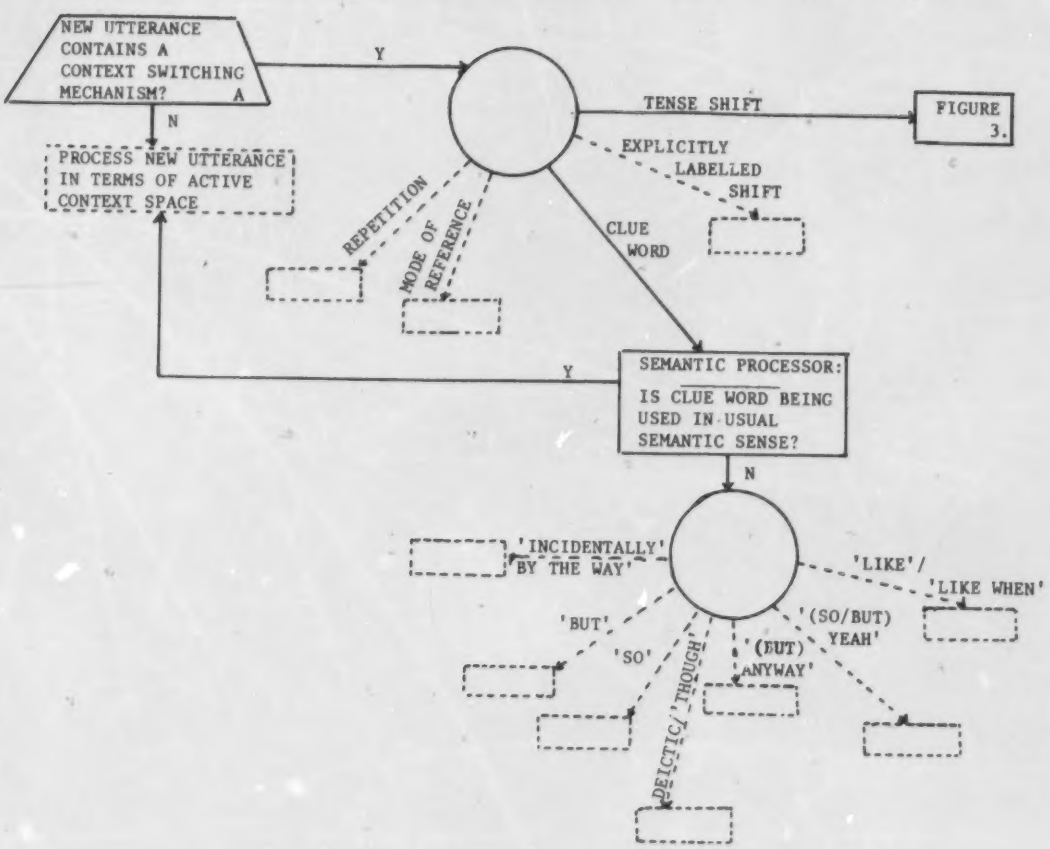

FIGURE 2

GOAL: TO INTEGRATE A NEW UTTERANCE WITH PRECEDING UTTERANCES.

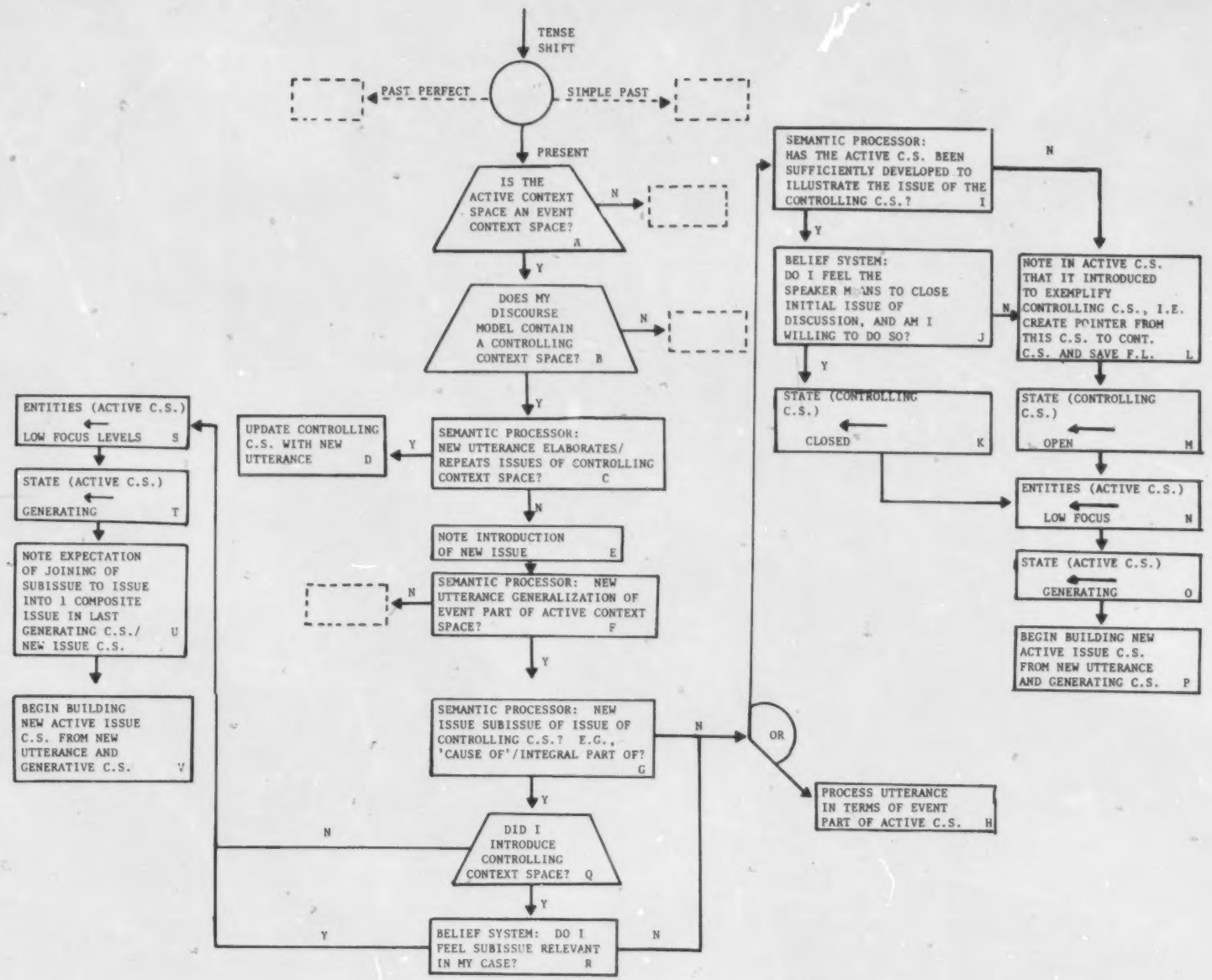
TENSE SHIFT
PAST PERFECT
SIMPLE PAST
PRESENT
IS THE ACTIVE CONTEXT SPACE AN EVENT CONTEXT SPACE? A
N
Y
DOES MY DISCOURSE MODEL CONTAIN A CONTROLLING CONTEXT SPACE? B
N
Y
SEMANTIC PROCESSOR: NEW UTTERANCE ELABORATES/ REPEATS ISSUES OF CONTROLLING CONTEXT SPACE? C
Y
UPDATE CONTROLLING C.S. WITH NEW UTTERANCE D
N
NOTE INTRODUCTION OF NEW ISSUE E
SEMANTIC PROCESSOR: NEW UTTERANCE GENERALIZATION OF EVENT PART OF ACTIVE CONTEXT SPACE? F
N
Y
SEMANTIC PROCESSOR: NEW ISSUE SUBISSUE OF ISSUE OF CONTROLLING C.S.? E.G., 'CAUSE OF'/INTEGRAL PART OF? G
N
Y
DID I INTRODUCE CONTROLLING CONTEXT SPACE? Q
N
Y
BELIEF SYSTEM: DO I FEEL SUBISSUE RELEVANT IN MY CASE? R
Y
N
ENTITIES (ACTIVE C.S.) LOW FOCUS LEVELS S
STATE (ACTIVE C.S.) GENERATING T
NOTE EXPECTATION OF JOINING OF SUBISSUE INTO 1 COMPOSITE ISSUE IN LAST GENERATING C.S./ NEW ISSUE C.S. U
BEGIN BUILDING NEW ACTIVE ISSUE C.S. FROM NEW UTTERANCE AND GENERATIVE C.S. V
OR
PROCESS UTTERANCE IN TERMS OF EVENT PART OF ACTIVE C.S. H
SEMANTIC PROCESSOR: HAS THE ACTIVE C.S. BEEN SUFFICIENTLY DEVELOPED TO ILLUSTRATE THE ISSUE OF THE CONTROLLING C.S.? I
N
Y
BELIEF SYSTEM: DO I FEEL THE SPEAKER MEANS TO CLOSE INITIAL ISSUE OF DISCUSSION, AND AM I WILLING TO DO SO? J
N
Y
STATE (CONTROLLING C.S.) CLOSED K
NOTE IN ACTIVE C.S. THAT IT INTRODUCED TO EXEMPLIFY CONTROLLING C.S., I.E. CREATE POINTER FROM THIS C.S. TO CONT. C.S. AND SAVE F.L. L
STATE (CONTROLLING C.S.) OPEN M
ENTITIES (ACTIVE C.S.) LOW FOCUS N
STATE (ACTIVE C.S.) GENERATING O
BEGIN BUILDING NEW ACTIVE ISSUE C.S. FROM NEW UTTERANCE AND GENERATING C.S. P

FIGURE 3

GOAL: TO INTEGRATE A NEW UTTERANCE WITH PRECEDING UTTERANCES HAVING DISCERNED A TENSE SHIFT.

If the new utterance does not refer to the issue already under discussion, the listener would note the introduction of a new issue context space (Configuration E, Figure 3). At this point, the listener must determine whether the new issue being highlighted is a generalization of an event part of the active context space (Configuration F, Figure 3). If it is, the listener must then consider whether this new issue can be seen as a subissue of tne initial issue under discussion (Configuration G, Figure 3).

If the new issue can be seen as a subissue, but the listener was the one who introduced the initial issue context space into the discussion, it is her/his prerogative to decide whether s/he sees this new subissue as being relevant in her/his case (Configurations Q and R, Figure 3).

A listener has two courses of action if s/he feels the subissue not relevant: Process the new issue only as it pertains to the active event context space, i.e., do not close the active context space or create a new active issue context space (Configuration H, Figure 3); follow the speaker's lead and create a new active issue context space.

If the latter option is chosen, a listener must first decide upon the status of the preceding issue context space before creating a new active issue context space. A listener can consider the introduction of a new issue context space in this environment as closing the controlling space if the event context space has been sufficiently developed to illustrate this issue, and s/he feels the speaker means to close it (Configurations I - K, Figure 3).

If the listener, however, feels that either s/he or the speaker might wish to further discuss the active or controlling context spaces, s/he will consider the introduction of this new issue context space an interruption. This decision results in the following changes in the listener's discourse model (Configurations L - P, Figure 3): A. A notation will be made in the active

context space that it was initially introduced to exemplify the issue of the controlling context space; B. current focus level assignments of the entities of the active context space will be saved; C. the controlling context space will be assigned an open state; D. the entities of the active context space will be assigned low focus levels; E. the active context space will be assigned a generating state; F. the new issue context space will become the active context space.(14)

Returning to Configuration R, Figure 3, had the listener felt that the issue raised by the speaker was indeed relevant to her/his initial concern in the controlling context space, the listener would not consider this discussion an interruption on the part of the speaker. This would be noted in the listener's discourse model by her/his not reassigning the controlling context space an open state. Rather, though the listener would create a new active issue context space, s/he would note the expectation of a joining of the new issue to the initial issue of discussion by leaving the initial issue of discourse in a controlling context space (Configurations S - V, Figure 3).

7. Excerpt 3 Analyzed In Terms Of The Theory

The following analysis of Excerpt 3 illustrates the parsing of a conversation into related context spaces, wherein each context space is defined by its constituent entities.

---

(14) Saving the 'environment' of the active event context space (via A. and B.) is necessary. After completion of the digression, a return to this event context space will automatically result in the re-establishment of its initial purpose in the discussion, i.e., we can then automatically re-establish the open issue context space as a controlling context space. To enable this the list of the constituent entities of a context space must be updated to include a pointer to a place wherein we can store the environment of an active context space when needed.

C1: Actors: P
Issue: P's assessment of her progress in reacting to unpleasant situations with people in general
Time: The present
Duration: The past few months

C2: Actors: P, Debbie
Main Event: A conversation between P and D
Event Parts: P interrupts D while D is speaking
D appears insulted
P notices D's discomfort
P continues speaking, and does not feel guilty over the situation
P asks D to continue what she had been saying
Time: The night before the present discussion between P and F
Duration: Unspecified
Location: P's apartment
Topic: P not getting upset or feeling guilty about D's getting uptight

The relationship between C1 and C2 is a Full Illustrative Relation.

C3: Actors: P, Cindy, and Bob
Main Event: P, C, and B at the movies
Event Parts: P feels that C is ignoring B
P does not feel responsible for the situation
Time: Sometime in the past
Duration: Unspecified
Location: A movie theater
Topic: P not feeling guilty or responsible for C's ignoring B

The relationship between C1 and C3 is a Reference Illustrative Relation.

C4: Actors: P, and people in general
Issue: P's belief that she notices unpleasant situations more than other people do
Time: The present
Duration: Unspecified

The relationship between C1,C2,C3 and C4 is a Subissue Relation. The relationship between C2,C3 and C4 is a Generalization Relation.

C5: Actors: P and Cindy
Objects: A tape
Main Event: A conversation between P and C
Event Parts: P is playing a tape
C asks P what tape she is playing
P says it is for school, but then decides to let C hear the part of the tape which concerns C
C states that she was unaware of her actions, as described by P in the tape
C then begins to discuss with P the referred to event

P does not wish to continue the discussion with C
Time: After a conversation between P and F about the events described in the tape
Duration: Unspecified
Location: Unspecified
Topic: C not being aware of an unpleasant situation, whereas, P was

The relationship between C4 and C5 is a Full Illustrative Relation.

The relationship between C1,C4 and the second citation of C3 is a Joining Relation.

C6: Actors: P,F, and a person A
Issue: P's uncalled fear that F would be disappointed in her action of having called person A, as the call enabled F to assess her progress in handling unpleasant situations

Time: The present
Duration: From the time of the call to date

The relationship between a previous discussion of C6,C1 and this citation of C6 is a Contrastive Respecification Relation.

In the table below, for each active context space, each of its constituent entities (as specified above) with its associated focus level and FL rule upon which the assignment is based, is listed. In addition, each of the context spaces preceding this one, with its associated state and SA rule upon which the assignment is based, is listed.

Context	Entity	F.L.	FL	P.C.	State	SA
C1	P	High	2			
	Issue	High	2			
	Time	Low	2			
	Duration	Low	2			
C2	P	High	8	C1	Controlling	1
	D.(vis a vis C2)	High	7			
	Main Event	Low	6			
	Event Part 1	Low	6			
	Event Part 2	Low	6			
	Event Part 3	Low	6			
	Event Part 4	High	9			
	Event Part 5	Low	6			
	Time	Low	7			
	Duration	Zero	1			
	Location	Low	7			

C3	P	High	8	C2	Closed	1
	C (vis-a-vis C3)	High	7	C1	Controlling	1
	B	Low	7			
	Main Event	Low	6			
	Event Part 1	Low	6			
	Event Part 2	High	9			
	Time	Low	7			
	Duration	Zero	1			
	Location	Low	7			
C4	P	High	2	C3	Generating	4
	Issue	High	2	C2	Generating	4
	Time	Low	2	C1	Controlling	4
	Duration	Zero	1			
C5	P	High	8	C4	Controlling	4
	C (vis-a-vis C5)	High	7	C3	Generating	4
	A Tape	Low	7	C2	Generating	4
	Main Event	Low	6	C1	Controlling	4
	Event Part 1	Low	6			
	Event Part 2	Low	6			
	Event Part 3	Low	6			
	Event Part 4	High	9			
	Event Part 5	Low	6			
	Event Part 6	Low	6			
	Time	Low	7			
	Duration	Zero	1			
	Location	Zero	1			
C6	P	High	2 & 20	C5	Closed	6
	F	High	2 & 20	C4	Closed	6
	A	Zero	1	C3	Closed	6
	Issue	High	2 & 20	C2	Closed	6
	Time	Low	20	C1	Controlling	6
	Duration	Zero	1			

Using these assignments and the Semantic Relational Rules we can now formally explain a number of the elements determining the conversants' choices of statements in the excerpt.

1. Notice that in citing C2 P does not mention other events that probably occurred in this episode between herself and Debbie. Her discussion is limited to those events that are necessary to make C2 understandable to F, as explained in SEM 10.
2. Though P demonstrates that she is bothered by the possibility that she interrupted Debbie, thereby causing the resulting unpleasant situation, she

does not allow herself to dwell on this part of the episode. SEM 12 explains P's reluctance to discuss this event part that introduces the tangential issue of P perhaps causing the unpleasant situations that she finds herself in.

3. In citing C3 P only mentions the main event and event part that exemplifies the issue in C1. SEM 9 explains P's choice of statements.

4. Knowledge of SEM 13 enables F to recognize that the 'there' in P's statement, 'But, uh, yeah, even <u>there</u>, I mean I noticed it but I didn't start feeling guilty about it,' is a reference to C3.

5. Reading the excerpt one finds F's response to P's statements appropriate. Its appropriateness is due to the fact that it concerns the issue upon which P has been focusing, as captured by SEM 5. We would probably all agree that responses by F that concerned either the movie mentioned by P in C3, or the tape recorder mentioned by P in C5, would be inappropriate. The inappropriateness of these responses are captured by SEM 15.

8. Conclusion

The underlying elements that govern conversational speech and by which conversants maintain coherency in their conversations are summarized below.

1a. A conversation is not merely a temporal sequence of utterances, but instead is made up of a number of context spaces. There are two types of context spaces that make up a conversation: issue context spaces and event context spaces.

1b. Both issue and event context spaces are made up of a number of constituent entities:

An issue context space is defined by a general activity, actors, time, duration period, and topic.

An event context space is defined by a main event and its parts, actors, time of occurrence, duration period, location, and topic.

2a. Associated with each context space is a state assignment which specifies the influence of the context space on succeeding utterances.

2b. Associated with each of the constituent entities of a context space is a focus level assignment that specifies the relative importance of each of the entities to the context space. The focus level of an entity determines its mode of reference and whether it is reasonable to further discuss it in succeeding utterances.

3a. A conversation is not a mere temporal sequence of unrelated context spaces. Context spaces themselves relate to each other and form hierarchical networks. The possible types of such relationships are:

1. Illustrative & Restatement Relations
2. Interruption & Return Relations
3. Subissue & Joining Relations
4. Respecification Relations
5. Total Shift Relation

3b. Each of the above relationships is governed by rules which constrain its formation. These rules are bound to the notion of state assignments.

4. There are specific linguistic rules that must be employed to enable smooth context space transitions. The five major mechanisms that have been demonstrated are:

1. Clue Word Shifts & Deictic Expressions
2. Explicitly Labelled Shifts
3. Mode of Reference
4. Repetition of Words
5. Tense Shift

5. These rules form a partial theory of conversation. A coherent conversation is one made up of context spaces related and formed by such rules.

A theory such as this is necessary to understand the nature of a conversation, and the high level syntactic and semantic relational rules that people seem to use in conversational speech.

9. Appendix

APPENDIX A

The State Assignment Rules

As each new context space is entered, it is assigned an active state. At the same time, the states of previous spaces are reassigned according to the rules listed below. The assignments are based on the relationship of those context spaces to the new one, and are from the speaker's perspective. The reader should refer back to Section 3 for the definition of each relationship and Section 4.2.2 for the definition of each state. In the table below, the introduction of a new active context space is represented by the creation of a new environment (i.e., ENV. in the table), and the context spaces involved are represented by parenthesized numbers, as defined in Section 3. For example, the Illustrative & Restatement Relations were represented by:

(1) Issue context space
(2) (Event context space that exemplifies the issue in (1))+
(3) Issue context space of (1) restated

The introduction of the initial issue context space (1) is represented by ENV. 1. Each citation of an event context space (2) is represented by ENV. 2, and the restatement of the initial issue context space (1) is represented by ENV. 3.

In the table only the first instance of an optionally repeatable item is specified. Each repeated instance of such an item closes the preceding citation of that item, and the new instance becomes the active context space. However, such a new citation does not affect the states of the context spaces of a different category. For example, the citation of a second event context space in an Illustrative Relation, closes the first event context space cited, but it does not affect the state of the issue context space that remains controlling.

(SA 1) Illustrative & Restatement

ENV. 1: (1) Active
ENV. 2: (1) Controlling (2) Active
ENV. 3: (2) Closed (3=1) Active

(SA 2) Generalization

ENV. 1: (1) Active
ENV. 2: (1) Generating (2) Active

(SA 3) Interruption & Return

ENV. 1: (1) Active
ENV. 2: (1) Open (2) Active
ENV. 3: (2) Closed (3=1) Active

(SA 4) Subissue & Joining

ENV. 1: (1) Active
ENV. 2: (1) Controlling (2) Active
ENV. 3: (1) Controlling (2) Generating (3) Active
ENV. 4: (1) Controlling (2) Generating (3) Controlling (4) Active
ENV. 5: (2) Closed (4) Closed (5=1&3) Active
or
ENV. 5: (1) Controlling (3) Controlling (4) Closed (5=2) Active

(SA 5) Respecification - New Perspective/Simple

ENV. 1: (1) Active
ENV. 2: (1&2) Appropriate assignments dependent on relationship
ENV. 3: (1&2) Closed (3) Active
ENV. 4: (2) Closed (3) Closed (4=1) Active

(SA 6) Respecification - Contrastive

ENV. 1: (1) Active
ENV. 2: (1&2) Appropriate assignments dependent on relationship
ENV. 3: (1&2) Closed (3) Active
ENV. 4: (2) Closed (3) Controlling (The issue context space) (4=1) Active

(SA 7) Total Shift

ENV. 1: (1) Active
ENV. 2: (1) Closed (2) Active

APPENDIX B

The Semantic Relational Rules

A semantic relational rule specifies what would be an appropriate continuance of previous utterances. These rules are determined by the underlying structure of a conversation, the states of preceding context spaces, and the focus level assignments of constituent entities of the active context space. The rules apply to both speakers and responders unless otherwise noted.

Structure - Context Space Relationships:

(SEM 1) After the specification of an event context space, it is appropriate to discuss one of its points in general terms, i.e., create an issue context space (A Generalization Relation), unless: (1) The event context space has been brought up specifically to illustrate a separate issue of concern, and the new issue being highlighted is not a subissue of this initial issue; or (2) a second issue context space has been introduced and not yet fully discussed. (Note that this does not imply that the event context space under discussion was introduced in connection with this issue context space.)

(SEM 2) After the specification of an issue context space, it is appropriate to cite an instance of that issue. (An Illustrative Relation)

(SEM 3) After the specification of an event context space as an illustration of a controlling issue context space, it is appropriate to generalize upon an event of that event context space that is not an instance of the issue under discussion if this new issue can be seen as a subissue of the issue of the controlling context space. (A Subissue Relation)

(SEM 4) It is appropriate to either generalize or particularize the issue of an issue context space. Such an action does not constitute a context space transition.

(SEM 5) After the specification of an issue context space, it is appropriate to rediscuss a closed context space in light of this new issue context space. (A Contrastive Respecification Relation)

(SEM 6) If there is a lapse in the conversation, or all the context spaces have been closed, then it is appropriate to begin a new and unrelated topic. If this is not the case it would be inappropriate to do so. (A Total Shift Relation)

States:

Open:

(SEM 7) In the presence of an open context space, it is inappropriate to create a second open context space, i.e., it would be inappropriate to digress on a digression.

(SEM 8) An open context space demands completion immediately after the digression has been concluded unless: External events prevent this; in the interim a new context space has been given an open state status (The context space most recently left open places the highest demand for a return.); much time has elapsed since the context space first became open. The strength of the demand of returning to an open context space is inversely proportional to the length of time for which the context space has such a status. The longer a context space is left open, the lower its influence on succeeding statements and the lower its chances of being returned to.

Controlling:

(SEM 9) In citing a reference illustrative context space, only the main event and the event parts that directly refer to the issue under discussion are appropriate.

(SEM 10) In citing a full illustrative context space, only brief mention of the event parts that occurred prior to the event part that is an instance of the issue under discussion, and that are necessary to make the episode understandable, is appropriate.

(SEM 11) In the presence of a controlling context space, elaboration upon actors and objects that were not part of the initial issue context space is inappropriate and constitutes a digression.

(SEM 12) In the presence of a controlling context space, elaboration upon any event part of the event context space that is not an instance of the issue of the controlling context space is inappropriate and constitutes a digression.

(SEM 13) In the presence of two controlling context space (i.e., a Subissue Relation), the joining of the issue of the last controlling context space to the issue of the first controlling context space is required, i.e., it would be inappropriate to have the subissue supersede the initial issue under discussion resulting in the abandonment of the initial issue.

Focus Levels: The following two rules apply to responders.

(SEM 14) For an utterance to be appropriate as a response to a speaker's development of a context space, it must at least concern an entity with a high focus level in the active context space.

(SEM 15) An utterance that is concerned with an entity from the active context space that has a low or medium focus level is an inappropriate response, and results in the formation of an Interruption Relation.

APPENDIX C

The Focus Level Algorithm

Each constituent entity of a given context space - actors, objects, events, issues, location, time, and duration period - has an associated focus level assignment. There are four levels of focus: high, medium, low, and zero. The focus level of an entity indicates its importance at a given time in the conversation. These assignments are derived from the relationship of the entity to the context space of which it is part, and the relationship that this context space has with preceding ones. It is clear that intonational stress and marked syntactic structures (i.e., such as topicalization, pseudo clefts, and clefts) can be used to determine, and do reflect, the focus levels of entities. These markers have not been incorporated or used in this work, because in the dialogues studied I did not find major employments of them. In addition, I believe the approach taken here elucidates the cognitive reasoning behind the differentiations, whereas a syntactic analysis does not.

The focus level assignments are from the speaker's perspective. The default assignments for the other participants are these same assignments, unless a succeeding utterance on the part of a participant indicates otherwise. A participant, P2, may not follow the lead of a speaker, P1, because s/he feels P1 was being inappropriate. This could occur, for example, if P2 felt that conventions called for P1 to be in the role of responder. In such a situation, P1 would not have the license to introduce new items into focus. Of course, an alternative cause may be just P2 being inappropriate.

(FL 1) All unspecified entities of a context space receive zero focus levels.

An Issue Context Space:

(FL 2) An initial issue context space sets up the concern to be focused upon. As a result the issue receives a high focus level. If the issue concerns an entity then that entity receives a high focus level as well. For example, if the issue is 'A's mother being clumsy', then A's mother, as well as the issue, receive high focus levels. All entities not mentioned as part of the issue receive low focus levels.

There is an interaction between the state of a context space and the focus levels of its constituent entities.

Closed:

(FL 3) When a context space is closed, all of its constituent entities receive zero focus levels.

Open, Controlling & Active:

(FL 4) The constituent entities of an open or controlling context space retain their focus level assignments throughout the time that the context space has such a status. All cited entities of an active context space are initially assigned low or medium focus levels (depending upon whether they are referred to by name or description), except those that are part of an open or controlling context space. The initial focus level assignments for these entities are those that they have in the open or controlling context space.

Generating:

(FL 5) The entities of a generating context space have low focus levels throughout the time that the context space has such a status.

There is an interaction between the relationship of a context space to previous ones and the resulting focus levels of its constituent entities.

Illustrative:

(FL 6) All events in the event context space in an Illustrative Relation (called a "subspace" of the initial issue context space), that are not instances of the issue in the issue context space are assigned low focus levels as these events merely serve as props or background to the point being made.

(FL 7) All entities cited in the subspace that do not play a role in the issue context space (i.e., within the issue itself) have initial low or medium focus level assignments. Main actors of the subspace may later receive high focus levels within that space if they are mentioned as agents of events occurring in the episode. However, they are only considered to be in high focus vis-a-vis the events of the subspace.

(FL 8) The actors in the subspace which are part of the initial concern retain their high focus level assignments within the subspace. (This follows from SA 1 and FL 4.)

(FL 9) The event part of the subspace that is an instance of the initial issue receives a high focus level assignment.

Restatement:

(FL 10) Upon the return to the issue context space all entities begin with the same focus levels as they had before the citation of the subspace. (This follows from SA 1 and FL 4.)

Generalization:

(FL 11) Actors of the generating context spaces that are cited in the succeeding issue context space receive high focus levels, after their first reintroduction in the issue context space.

(FL 12) The activity of the generating context spaces which is cited in the succeeding issue context space receives a high focus level in the issue context space.

Interruption: One need only discuss an interruption that is caused by an item mentioned in the preceding context space, as in the other two cases (i.e., a forgotten item; an external event) there is no overlap of concepts between the initial context space and the context space which serves as a digression.

(FL 13) The initial focus level assignments of the actors of the succeeding context space that appeared in the interrupted context space are those which these actors had in the interrupted space. (This follows from SA 3 and FL 4.)

(FL 14) If any new actors appear within the new context space they are assigned low focus levels.

(FL 15) Events not related to the concepts that triggered the digression receive only low focus levels.

(FL 16) Events related directly to the concepts that triggered the digression receive high focus levels.

Return:

(FL 17) Upon the return to the interrupted context space all of its entities begin with the same focus level assignments as before the digression. (This follows from SA 3 and FL 4.)

Subissue:

(FL 18) Same as FL 11 & 12

Joining:

(FL 19) Same as FL 10

Respecification:

(FL 20) In a New Perspective Respecification Relation, focus level assignments are the same as in a Total Shift Relation. In a Simple Respecification Relation, all entities have low focus level assignments until the context space is firmly re-established. Once it is re-established, its entities are assigned the focus level assignments that they had in the first specification of the context space. In a Contrastive Respecification Relation, entities that are contrasted with the issue in the controlling context space receive high focus levels. Other cited entities have low focus levels. (This follows from SA 6 and FL 3 & 4.)

Total Shift:

(FL 21) Upon entrance to the succeeding context space all entities have zero focus levels. (This follows from SA 7 and FL 3 & 4.) First references to entities put them in low or medium focus, except for entities mentioned as agents of events. They are assigned high focus levels after their first reference.

The focus level of an actor A can shift from high to medium within a single context space if:

(FL 22) A second participant is introduced in conjunction with actor A as being equally involved in the events or issue under discussion. In such a case neither individual actor has a high focus level.

(FL 23) A second entity is brought into high focus from a medium focus level by the discussion of an event part in which that actor acted as agent and actor A did not.

ACKNOWLEDGEMENTS

I would like especially to thank Allan Collins for his constant encouragement, interest, and comments on both the theoretical and stylistic aspects of this work. I would also like to thank Bill Woods and Andee Rubin for insightful comments and discussion on foundational aspects of this paper, Ron Brachman for assisting me in expressing my observations as a theory, and Chip Bruce, Phil Cohen, and Bonnie Nash-Webber for editing drafts of this paper.

REFERENCES

[1] Allen, J. & Perrault, R. Participating in dialogues: Understanding via plan deduction. To appear in Proc Canadian Society for Computational Studies of Intelligence, July 1978.

[2] Bransford, J. D. & Johnson, M. K. Contextual prerequisites for understanding: Some investigations of comprehension and recall. Journal of Verbal Learning and Verbal Behavior, 1972, 11, 717-726.

[3] Bransford, J. D. & Johnson, M. K. Considerations of some problems of comprehension. In W. Chase (Ed.), Visual information processing. New York: Academic Press, 1973.

[4] Bruce, B. Plans and social actions. Technical report no. 34, Bolt Beranek and Newman Inc., Massachusetts, 1977.

[5] Bullwinkle, C. Levels of complexity in discourse for anaphora disambiguation and speech act interpretation. Proc 5th IJCAI, August 1977.

[6] Cohen, P. R. On knowing what to say: Planning speech acts. Ph.D. dissertation, Technical report no. 118, University of Toronto, Toronto, 1978.

[7] Dore, J. "On them sheriff": A pragmatic analysis of childrens' responses to questions. In S. Ervin-Tripp and C. Mitchell-Kernan (Eds.) Child Discourse. New York: Academic Press, 1977, Pp. 139-164.

[8] Grosz, B.J. The representation and use of focus in dialogue understanding. Ph.D. dissertation, University of California, Berkeley, 1977.

[9] Kaplan, S. J. Cooperative responses from a natural language data base query system. Preliminary report, University of Pennsylvania, Pennsylvania, 1977.

[10] Labov, W. & Fanshel, D. Therapeutic discourse. New York: Academic Press, 1977.

[11] Reichenbach, H. Elements of symbolic logic. New York: MacMillan Company, 1947.

[12] Rubin, A. A theoretical taxonomy of the differences between oral and written language. Technical report no. 35, Bolt Beranek and Newman Inc., Massachusetts, 1977.

[13] Schank, R. Rules and topics in conversation. Cognitive Science, 1977, 1, 421-441.

CENTER FOR THE STUDY OF READING

READING EDUCATION REPORTS

No. 1: Durkin, D. Comprehension Instruction--Where Are You?, October 1977. (ERIC Document Reproduction Service No. ED 146 566, 14p., HC-$1.67, MF-$.83)

No. 2: Asher, S. R. Sex Differences in Reading Achievement, October 1977. (ERIC Document Reproduction Service No. ED 146 567, 30p., HC-$2.06, MF-$.83)

No. 3: Adams, M. J., Anderson, R. C., & Durkin, D. Beginning Reading: Theory and Practice, November 1977.

No. 4: Jenkins, J. R., & Pany, D. Teaching Reading Comprehension in the Middle Grades, January 1978.

No. 5: Bruce, B. What Makes a Good Story?, June 1978.

CENTER FOR THE STUDY OF READING

TECHNICAL REPORTS

* Available only through ERIC

*No. 1: Halff, H. M. Graphical Evaluation of Hierarchical Clustering Schemes, October 1975. (ERIC Document Reproduction Service No. ED 134 926, 11p., HC-$1.67, MF-$.83)

*No. 2: Spiro, R. J. Inferential Reconstruction in Memory for Connected Discourse, October 1975. (ERIC Document Reproduction Service No. ED 136 187, 81p., HC-$4.67, MF-$.83)

*No. 3: Goetz, E. T. Sentences in Lists and in Connected Discourse, November 1975. (ERIC Document Reproduction Service No. ED 134 927, 75p., HC-$3.50, MF-$.83)

*No. 4: Alessi, S. M., Anderson, T. H., & Biddle, W. B. Hardware and Software Considerations in Computer Based Course Management, November 1975. (ERIC Document Reproduction Service No. ED 134 928, 21p., HC-$1.67, MF-$.83)

*No. 5: Schallert, D. L. Improving Memory for Prose: The Relationship Between Depth of Processing and Context, November 1975. (ERIC Document Reproduction Service No. ED 134 929, 37p., HC-$2.06, MF-$.83)

*No. 6: Anderson, R. C., Goetz, E. T., Pichert, J. W., & Halff, H. M. Two Faces of the Conceptual Peg Hypothesis, January 1976. (ERIC Document Reproduction Service No. ED 134 930, 29p., HC-$2.06, MF-$.83)

*No. 7: Ortony, A. Names, Descriptions, and Pragmatics, February 1976. (ERIC Document Reproduction Service No. ED 134 931, 25p., HC-$1.67, MF-$.83)

*No. 8: Mason, J. M. Questioning the Notion of Independent Processing Stages in Reading, February 1976. (Journal of Educational Psychology, 1977, 69, 288-297)

*No. 9: Siegel, M. A. Teacher Behaviors and Curriculum Packages: Implications for Research and Teacher Education, April 1976. (ERIC Document Reproduction Service No. ED 134 932, 42p., HC-$2.06, MF-$.83)

*No. 10: Anderson, R. C., Pichert, J. W., Goetz, E. T., Schallert, D. L., Stevens, K. V., & Trollip, S. R. Instantiation of General Terms, March 1976. (ERIC Document Reproduction Service No. ED 134 933, 30p., HC-$2.06, MF-$.83)

*No. 11: Armbruster, B. B. Learning Principles from Prose: A Cognitive Approach Based on Schema Theory, July 1976. (ERIC Document Reproduction Service No. ED 134 934, 48p., HC-$.206, MF-$.83)

*No. 12: Anderson, R. C., Reynolds, R. E., Schallert, D. L., & Goetz, E. T. Frameworks for Comprehending Discourse, July 1976. (ERIC Document Reproduction Service No. ED 134 935, 33p., HC-$2.06, MF-$.83)

No. 13: Rubin, A. D., Bruce, B. C., & Brown, J. S. A Process-oriented language for Describing Aspects of Reading Comprehension, November 1976. (ERIC Document Reproduction Service No. ED 136 188, 41p., HC-$2.06, MF-$.83)

No. 14: Pichert, J. W., & Anderson, R. C. Taking Different Perspectives on a Story, November 1976. (ERIC Document Reproduction Service No. ED 134 936, 30p., HC-$2.06, MF-$.83)

No. 15: Schwartz, R. M. Strategic Processes in Beginning Reading, November 1976. (ERIC Document Reproduction Service No. ED 134 937, 19p., HC-$1.67, MF-$.83)

No. 16: Jenkins, J. R., & Pany, D. Curriculum Biases in Reading Achievement Tests, November 1976. (ERIC Document Reproduction Service No. ED 134 938, 24p., HC-$1.67, MF-$.83)

No. 17: Asher, S. R., Hymel, S., & Wigfield, A. Children's Comprehension of High- and Low-Interest Material and a Comparison of Two Cloze Scoring Methods, November 1976. (ERIC Document Reproduction Service No. ED 134 939, 32p., HC-$2.06, MF-$.83)

No. 18: Brown, A. L., Smiley, S. S., Day, J. D., Townsend, M. A. R., & Lawton, S. C. Intrusion of a Thematic Idea in Children's Comprehension and Retention of Stories, December 1976. (ERIC Document Reproduction Service No. ED 136 189, 39p., HC-$2.06, MF-$.83)

No. 19: Kleiman, G. M. The Prelinguistic Cognitive Basis of Children's Communicative Intentions, February 1977. (ERIC Document Reproduction Service No. ED 134 940, 51p., HC-$3.50, MF-$.83)

No. 20: Kleiman, G. M. The Effect of Previous Context on Reading Individual Words, February 1977. (ERIC Document Reproduction Service No. ED 134 941, 76p., HC-$4.67, MF-$.83)

No. 21: Kane, J. H., & Anderson, R. C. Depth of Processing and Interference Effects in the Learning and Remembering of Sentences, February 1977. (ERIC Document Reproduction Service No. ED 134 942, 29p., HC-$2.06, MF-$.83)

No. 22: Brown, A. L., & Campione, J. C. Memory Strategies in Learning: Training Children to Study Strategically, March 1977. (ERIC Document Reproduction Service No. ED 136 234, 54p., HC-$3.50, MF-$.83)

No. 23: Smiley, S. S., Oakley, D. D., Worthen, D., Campione, J. C., & Brown, A. L. Recall of Thematically Relevant Material by Adolescent Good and Poor Readers as a Function of Written Versus Oral Presentation, March 1977. (ERIC Document Reproduction Service No. ED 136 235, 23p., HC-$1.67, MF-$.83)

No. 24: Anderson, R. C., Spiro, R. J., & Anderson, M. C. Schemata as Scaffolding for the Representation of Information in Connected Discourse, March 1977. (ERIC Document Reproduction Service No. ED 136 236, 18p., HC-$1.67, MF-$.83)

No. 25: Pany, D., & Jenkins, J. R. Learning Word Meanings: A Comparison of Instructional Procedures and Effects on Measures of Reading Comprehension with Learning Disabled Students, March 1977. (ERIC Document Reproduction Service No. ED 136 237, 34p., HC-$2.06, MF-$.83)

No. 26: Armbruster, B. B., Stevens, R. J., & Rosenshine, B. Analyzing Content Coverage and Emphasis: A Study of Three Curricula and Two Tests, March 1977. (ERIC Document Reproduction Service No. ED 136 238, 22p., HC-$1.67, MF-$.83)

No. 27: Ortony, A., Reynolds, R. E., & Arter, J. A. Metaphor: Theoretical and Empirical Research, March 1977.

No. 28: Ortony, A. Remembering and Understanding Jabberwocky and Small-Talk, March 1977. (ERIC Document Reproduction Service No. ED 137 753, 36 p., HC-$2.06, MF-$.83)

No. 29: Schallert, D. L., Kleiman, G. M., & Rubin, A. D. Analysis of Differences Between Oral and Written Language, April 1977. (ERIC Document Reproduction Service No. ED 144 038, 33p., HC-$2.06, MF-$.83)

No. 30: Goetz, E. T., & Osborn, J. Procedures for Sampling Texts and Tasks in Kindergarten through Eighth Grade, April 1977. (ERIC Document Reproduction Service No. ED 146 565, 80p., HC-$4.67, MF-$.83)

No. 31: Nash-Webber, B. Anaphora: A Cross-Disciplinary Survey, April 1977. (ERIC Document Reproduction Service No. ED 144 039, 43p., HC-$2.06, MF-$.83)

No. 32: Adams, M. J., & Collins, A. A Schema-Theoretic View of Reading Comprehension, April 1977. (ERIC Document Reproduction Service No. ED 146 565, 80p., HC-$4.67, MF-$.83)

No. 33: Huggins, A. W. F. Syntactic Aspects of Reading Comprehension, April 1977. (ERIC Document Reproduction Service No. ED 142 972, 68p., HC-$3.50, MF-$.83)

No. 34: Bruce, B. C. Plans and Social Actions, April 1977.

No. 35: Rubin, A. D. Comprehension Processes in Oral and Written Language, April 1977.

No. 36: Nash-Webber, B., & Reiter, R. Anaphora and Logical Form: On Formal Meaning Representations for Natural Language, April 1977. (ERIC Document Reproduction Service No. ED 142 973, 42p., HC-$2.06, MF-$.83)

No. 37: Adams, M. J. Failures to Comprehend and Levels of Processing in Reading, April 1977.

No. 38: Woods, W. A. Multiple Theory Formation in High-Level Perception, April 1977. (ERIC Document Reproduction Service No. ED 144 020, 58p., HC-$3.50, MF-$.83)

No. 40: Collins, A., Brown, J. S., & Larkin, K. M. Inference in Text Understanding, December 1977.

No. 41: Anderson, R. C., & Pichert, J. W. Recall of Previously Unrecallable Information Following a Shift in Perspective, April 1977. (ERIC Document Reproduction Service No. ED 142 974, 37p., HC-$2.06, MF-$.83)

No. 42: Mason, J., Osborn, J., & Rosenshine, B. A Consideration of Skill Hierarchy Approaches to the Teaching of Reading, December 1977.

No. 43: Collins, A., Brown, A. L., Morgan, J. L., & Brewer, W. F. The Analysis of Reading Tasks and Texts, April 1977.

No. 44: McClure, E. Aspects of Code-Switching in the Discourse of Bilingual Mexican-American Children, April 1977. (ERIC Document Reproduction Service No. ED 142 975, 39p., HC-$2.06, MF-$.83)

No. 45: Schwartz, R. M. Relation of Context Utilization and Orthographic Automaticity in Word Identification, May 1977.

No. 46: Anderson, R. C., Stevens, K. C., Shifrin, Z., & Osborn, J. Instantiation of Word Meanings in Children, May 1977. (ERIC Document Reproduction Service No. ED 142 976, 22p., HC-$1.67, MF-$.83)

No. 47: Brown, A. L. Knowing When, Where, and How to Remember: A Problem of Metacognition, June 1977. (ERIC Document Reproduction Service No. ED 146 562, 152p., HC-$8.69, MF-$.83)

No. 48: Brown, A. L., & DeLoache, J. S. Skills, Plans, and Self-Regulation, July 1977. (ERIC Document Reproduction Service No. ED 144 040, 66p., HC-$3.50, MF-$.83)

No. 49: Goetz, E. T. Inferences in the Comprehension of and Memory for Text, July 1977.

No. 50: Anderson, R. C. Schema-Directed Processes in Language Comprehension, July 1977. (ERIC Document Reproduction Service No. ED 142 977, 33p., HC-$2.06, MF-$.83)

No. 51: Brown, A. L. Theories of Memory and the Problems of Development: Activity, Growth, and Knowledge, July 1977. (ERIC Document Reproduction Service No. ED 144 041, 59p., HC-$3.50, MF-$.83)

No. 52: Morgan, J. L. Two Types of Convention in Indirect Speech Acts, July 1977.

No. 53: Brown, A. L., Smiley, S. S., & Lawton, S. C. The Effects of Experience on the Selection of Suitable Retrieval Cues for Studying from Prose Passages, July 1977. (ERIC Document Reproduction Service No. ED 144 042, 30p., HC-$2.06, MF-$.83)

No. 54: Fleisher, L. S., & Jenkins, J. R. Effects of Contextualized and Decontextualized Practice Conditions on Word Recognition, July 1977. (ERIC Document Reproduction Service No. ED 144 043, 37p., HC-$2.06, MF-$.83)

No. 55: Jenkins, J. R., & Larson, K. Evaluating Error Correction Procedures for Oral Reading, June 1978.

No. 56: Anderson, T. H., Standiford, S. N., & Alessi, S. M. Computer Assisted Problem Solving in an Introductory Statistics Course, August 1977. (ERIC Document Reproduction Service No. ED 146 563, 26p., HC-$2.06, MF-$.83)

No. 57: Barnitz, J. Interrelationship of Orthography and Phonological Structure in Learning to Read, August 1977.

No. 58: Mason, J. M. The Role of Strategy in Reading in the Mentally Retarded, September 1977.

No. 59: Mason, J. M. Reading Readiness: A Definition and Skills Hierarchy from Preschoolers' Developing Conceptions of Print, September 1977.

No. 60: Spiro, R. J., & Esposito, J. J. Superficial Processing of Explicit Inferences in Text, December 1977.

No. 61: Spiro, R. J., & Smith, D. Distinguishing Sub-Types of Poor Comprehenders: Overreliance on Conceptual vs. Data-Driven Processes, April 1978.

No. 65: Brewer, W. F. Memory for the Pragmatic Implications of Sentences, October 1977. (ERIC Document Reproduction Service No. ED 146 564, 27p., HC-$2.06, MF-$.83)

No. 66: Brown, A. L., & Smiley, S. S. The Development of Strategies for Studying Prose Passages, October 1977.

No. 68: Stein, N. L., & Nezworski, T. The Effects of Organization and Instructional Set on Story Memory, January 1978.

No. 69: Stein, N. L. How Children Understand Stories: A Developmental Analysis, March 1978.

No. 76: Thieman, T. J., & Brown, A. L. The Effects of Semantic and Formal Similarity on Recognition Memory for Sentences in Children, November 1977.

No. 77: Nash-Webber, B. L. Inference in an Approach to Discourse Anaphora, January 1978.

No. 78: Gentner, D. On Relational Meaning: The Acquisition of Verb Meaning, December 1977.

No. 79: Royer, J. M. Theories of Learning Transfer, January 1978.

No. 80: Arter, J. A., & Jenkins, J. R. Differential Diagnosis-Prescriptive Teaching: A Critical Appraisal, January 1978.

No. 81: Shoben, E. J. Choosing a Model of Sentence Picture Comparisons: A Reply to Catlin and Jones, February 1978.

No. 82: Steffensen, M. S. Bereiter and Engelmann Reconsidered: The Evidence from Children Acquiring Black English Vernacular, March 1978.

No. 83: Reynolds, R. E., Standiford, S. N., & Anderson, R. C. Distribution of Reading Time when questions are Asked about a Restricted Category of Text Information, April 1978.

No. 84: Baker, L. Processing Temporal Relationships in Simple Stories: Effects of Input Sequence, April 1978.

No. 85: Mason, J. M., Knisely, E., & Kendall, J. Effects of Polysemous Words on Sentence Comprehension, May 1978.

No. 86: Anderson, T. H., Wardrop, J. L., Hively, W., Muller, K. E., Anderson, R. I., Hastings, C. N., & Frederiksen, J. Development and Trial of a Model for Developing Domain Referenced Tests of Reading Comprehension, May 1978.

No. 87: André, M. E. D. A., & Anderson, T. H. The Development and Evaluation of a Self-Questioning Study Technique, June 1978.

No. 88: Bruce, B., & Newman, D. Interacting Plans, June 1978.

No. 89: Bruce, B., Collins, A., Rubin, A. D., & Gentner, D. A Cognitive Science Approach to Writing, June 1978.

No. 90: Asher, S. T. Referential Communication, June 1978.

No. 91: Royer, J. M., & Cunningham, D. J. On the Theory and Measurement of Reading Comprehension, June 1978.

No. 92: Mason, J. M., & Kendall, J. R. Facilitating Reading Comprehension through Text Structure Manipulation, June 1978.

No. 93: Ortony, A., Schallert, D. L., Reynolds, R. E., & Antos, S. J. Interpreting Metaphors and Idioms: Some Effects of Context on Comprehension, July 1978.

No. 94: Brown, A. L., Campione, J. C., & Barclay, C. R. Training Self-checking Routines for Estimating Test Readiness: Generalization from List Learning to Prose Recall, July 1978.

No. 95: Reichman, R. Conversational Coherency, July 1978.